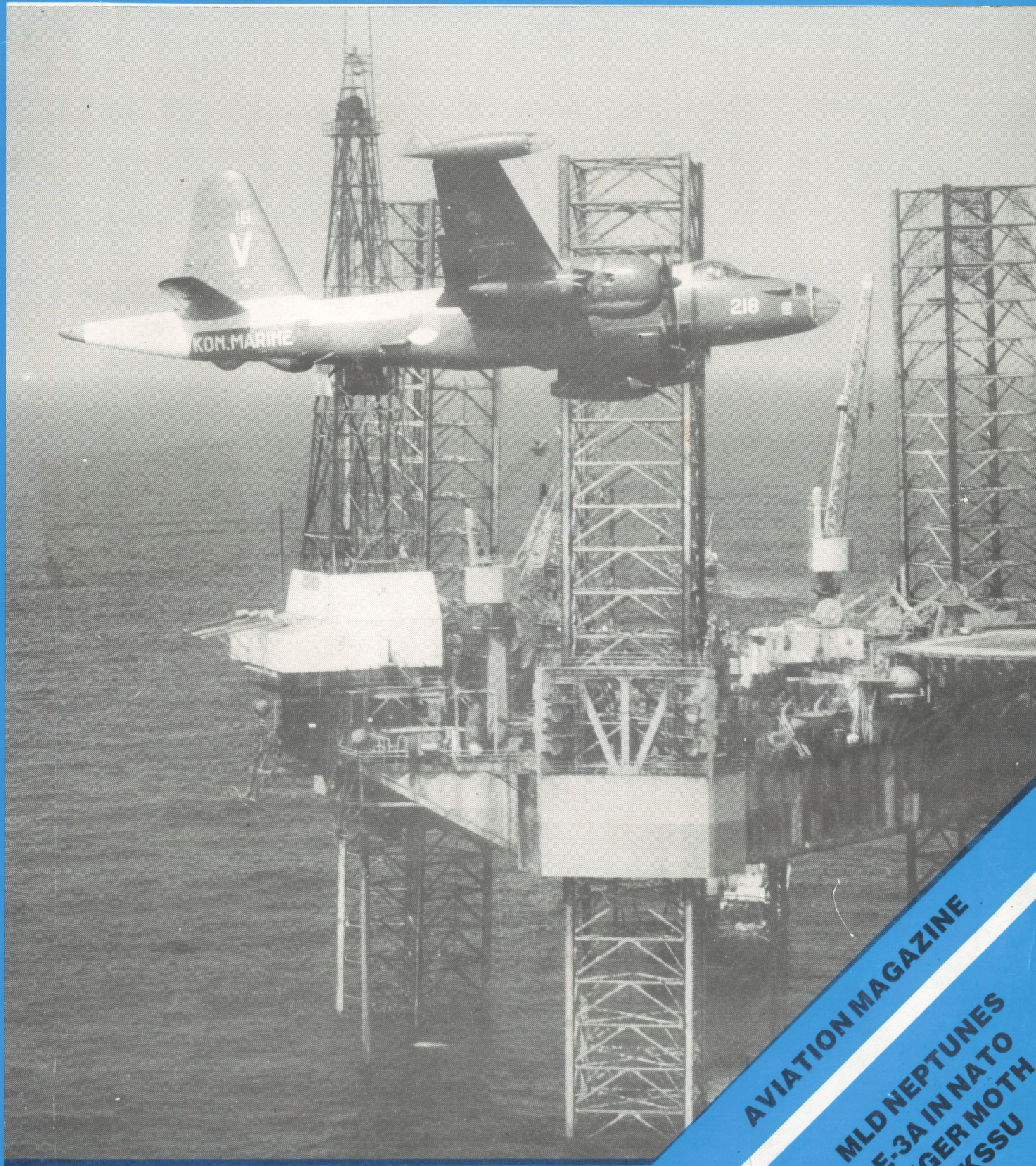


# FLASH

JANUARY 1980



AVIATION MAGAZINE

MLD NEPTUNES  
F-3A IN NATO  
TIGER MOTH  
KSSU



# Neptunes about to be withdrawn



The first Lockheed Neptunes, XP2V-1 Bu.No.48237 made its first flight in May 1945. Now 35 years later, the Neptune still serves in five air arms in Argentina, France, Japan, Netherlands, and Portugal. Except for Argentina all other countries are in the process of replacing the Neptune.

France intends to operate the Neptune till the Atlantic Novelles Generation (ANG) enters service in 1986.

Japan has still 83 P-2J Neptunes in service, but the first three of 45 P-3C Orions will be delivered in 1981. The Netherlands is phasing out the Neptune and will receive its first P-3C Orion in late 1981 (see article on p.13-15).

Portugal is negotiating the purchase of ex-USNavy P-3 Orions, but has financial problems.

(Photos from the files of Aviation Photos International: SP-2H Neptune 147562 Aeronavale, P-2J Neptune 4729 Japan Maritime SDF of 203 Sqn (A.Watanabe), and P-2E Neptune 4711 Portuguese AF (P.Bennet)).



**COVER PHOTO:** Marine Luchtvaart Dienst (Netherlands Naval Air Arm) SP-2H Neptune on patrol over the North Sea, checking the legality of oil rigs. (Kon.Marine/Audio Visuele Dienst)





**P.O.BOX 855  
5600 AW EINDHOVEN  
HOLLAND**

**Telephone : 040-525661  
Telex: 52572 spidy nl (ref. FLASH 553)**

**Editor** Peter van de Krommenacker  
**Managing editor** Jac van Tuyn  
**Commercial aviation editor** Jacob Struben  
**General aviation editor** Coen van den Heuvel  
**Military aviation editor** Jac van Tuyn  
**Photography** Paul van Oers  
**Subscriptions & bookservice** Coen van den Heuvel  
**Contributing reporters** Frank Klaassen  
Frank Swinkels  
Ben Ullings

FLASH is a monthly magazine about operational aviation, published by Stichting FLASH Aviation. The magazine describes military, commercial and general aviation as it happens from day to day in Europe.

#### **Agencies:**

Barry Bailey-Hickman  
84 Farmer Ward Road  
Kenilworth  
Warwicks CV8 2DN U.K.  
Frank Smith  
Viale della Pace 164  
36100 Vicenza Italy  
Gerd Lammers & Georg Büning  
4281 Raesfeld  
Weidegrund 26 W.Germany  
Stephen Kunz  
Altweg 762  
4805 Brittnau Switzerland

#### **Subscription rates per year:**

|                    |            |
|--------------------|------------|
| Holland            | DFL 32.00  |
| U.K.               | L 6.50     |
| Belgium            | B.Fr 490   |
| Italy              | L 12.500   |
| France             | F.Fr 78.00 |
| W.Germany          | DM 34.00   |
| Rest Europe        | DFL 36.00  |
| Overseas (surface) | DFL 36.00  |
| Overseas (airmail) | on request |
| Single copies      | DFL 3.00   |

#### **Payments:**

● Giroaccount No.3126138, P.v.d.Krommenacker, v.Ostadepad 9, Best, Holland.  
● Bankaccount No.44.46.20.370, Amrobank, Eindhoven, Holland.  
● International MOney Order to the editorial address.  
British, Italian and German subscribers can pay directly to the local agents.  
Bankcheques (excluding Eurocheques) sent to the editorial address will NOT be accepted unless DFL 5.00 is added. To cover costs the bank charges FLASH to cash the cheque.

The entire contents are copyright  
© 1980 by Stichting FLASH Aviation.

## EDITORIAL

### Dutch follow-on order 22 F-16s

The Dutch Minister of Defence, Drs. de Geus and Secretary of State for defence Dr. W.F. van Eekelen, recently announced the intention for the first annual follow-on order for F-16 fighter-bombers for the Koninklijke Luchtmacht (Dutch air force).

With this follow-on order for 22 F-16s there has been close contact between the Netherlands and the USA, during discussions it appeared that the production of some parts lasts three years. If the Netherlands wanted to keep their production line open without interruption, the order had to be placed now, as the last F-16 of the batch currently under construction, will leave the line in June 1984. If the Netherlands waits till the end of 1981, the production would be interrupted, which would result in higher costs.

It also appeared that if the Netherlands would catch up with the delivery schedule of General Dynamics, administration and contracts could be simplified. As a result Netherlands' first follow-on order only contains 22 F-16s to be delivered within eleven months (from 1 July 1984 till 1 June 1985), and only then start with annually delivery batches of 24 F-16s. The second follow-on order will also contain the first follow-on order for support material which will be delivered within two and a half years, i.e. at the same time as the first follow-on F-16s are delivered. The support materials amount to an additional 25% of the price per aircraft, but as there are already F-16s in use, only 64 out of a total of 111 F-16s to be ordered will need these supplies.

Also of importance in the bilateral talks was the setting up of a programme in which it would be possible for the other European countries operating F-16s to participate, should Belgium, Denmark or Norway decide to place a follow-on later on. In this case the compensation orders for the Netherlands have to be revised; if the three countries wouldn't participate anymore, the compensation percentage would decrease from 52% to around 30%. New arrangements have therefore been made with the US by which the 52% compensation will be maintained; the Netherlands will produce more parts for USAF F-16s and three new parts will be produced by Fokker. With the production of these parts experience can be gained with new technologies while on the other hand the number of people annually involved in the production of F-16s in the Netherlands increases to 1220 if the follow-on order is placed with Fokker. After all, a parliamentary approval for the buy has not yet been given and if it is given, it might be subject to the condition that the order is placed with General Dynamics. This would save 59 million guilders (\$ 29 million) on a total price of 463 million guilders for the 22 F-16s. However, then there won't be any participation of the Netherlands in the production process. The price mentioned for the order is based on a monthly production in the US and the Netherlands of 16 aircraft. The total of 16 is built up on 8 aircraft for the USAF, 2 for the Koninklijke Luchtmacht and the others are expected to be ordered by other countries. In the worst case, that means if only the USAF and the Koninklijke Luchtmacht will buy (additional) F-16s, only ten per month will be produced, due to which the price per aircraft will rise 4,8 percent.

If an air force needs an aircraft, it is easy to say "give them the aircraft" - discussion closed. However, it is not that easy, as these expensive aircraft have to be financed with tax money. A tiny one percent can easily be overlooked, but like in the case of the 22 F-16s, it could save more than four and a half million guilders. And that's what these matters are all about. Every bit, no matter how small, needs to be discussed as it is the actual money involved that counts. Money which hasn't to be charged on the Dutch taxpayer, or money which can be spent for other purposes, like the F.29 project. CvdH

#### **New subscription rates**

Price increases of paper, printing, postage and photo materials, raised also the production costs for FLASH. For almost two years we have been able to keep the FLASH subscription rates fixed, but as of January 1981 the subscription rates have been raised. For details see colophon elsewhere on this page. P.v.d.Krommenacker





# MILITARY AVIATION NEWS

## Westwinds to operate for the German navy

(MOENCHENGLADBACH, WEST GERMANY) Next February the first civilian registered IAI Westwind I will start serving the Bundesmarine as a target-tug. By April 1981 four Westwinds will be operating from Lübeck, West Germany. The aircraft are owned and operated by Rheine Flugzeugbau, the VFW subsidiary, which is currently converting the first aircraft by installing target towing equipment (including a 6 km (3.75 miles) cable) and a score monitoring device. After the initial conversion work at RFB's Mönchengladbach works, the aircraft went back to IAI for installation of a heavy-duty power system to cope with the additional equipment. The Westwind I was chosen in favour of the (VFW) Hansajet and fast turboprop aircraft. The former was too expensive for the Bundesmarine, who set a financial as well as a performance target, leaving the selection up to RFB. And the faster turboprops, though cheaper than Hansajet or Westwind, were too slow.

- The Ilmavoimat has ordered three Learjet 35As equipped for various support tasks, such as target towing, medical evacuation, aerial photography (mapping and sideways), coastal patrol and pollution control. The three aircraft, which will as far as target towing is concerned replace four Ilyushin IL-28s, will be delivered to Finland between June and September 1982. The Learjet 35As will in fact mainly operate as target tugs in conjunction with the Hawk T.51s, for combat pilot training.

## Four E-3As deploy to Ramstein

(RAMSTEIN AB, WEST GERMANY). Four USAF E-3A Sentries of 552 AW & CW, Tinker AFB, have arrived at Ramstein AB for a TDY ( "Temporary Duty" ) of unknown duration. The first E-3A landed on 10 December, an event which was covered extensively by the news media, as this deployment had been announced by NATO and by the US Department of Defence as a sign of NATO's intention to keep a close eye on the tense military situation in and around Poland. The aircraft are under SACEUR (Supreme Allied Commander Europe) control.

- For a report on NATO's E-3A programme, see pages 10 to 12.

## 25 production Tornados finished

(MÜNCHEN, WEST GERMANY). By 1 December twenty-five production Tornados had made their first flight. By 1 January forty production aircraft were expected to have flown, which should all be delivered by 1 April 1981. These forty aircraft represent the first production batch (ordered July 1976) for the RAF (twelve GR.1 trainers, eleven GR.1 combat aircraft), and West Germany (seventeen trainers and combat aircraft for the Luftwaffe and Bundesmarine). The second production batch is for 110 aircraft (55 RAF, 40 West Germany, and 15 AMI). Production of long-lead items for this batch is reported to be on schedule.

- The third and final Tornado F.2 prototype, ZA283 made its first flight from Warton, UK, on 18 November. The aircraft is painted in a very operational looking colour scheme of air superiority grey, with light tone markings, including the serial on the fin, in light grey or white.

*Tornado A03/ZA283 testing handling characteristics with gear down. A03 made its first flight on 18 November 1980, lasting 62 minutes and included aircraft and engine handling trials at various speeds. This third and last Tornado Air Defence prototype will be concerned primarily with Air Intercept Radar development and evaluation.*

*(British Aerospace)*







No.230 Squadron took over from No.18 Squadron in providing tactical transport and battlefield support frontline for 1(British) Corps in West Germany. Illustrated is Puma HC.1 XW222/DN of No.230 Sqn just in front of the Arminius Monument near Detmold. (RAF Germany)

### Bolivian F.27-400QCs stored at Woensdrecht

(SCHIPHOL/DEN HAAG, HOLLAND) Two F.27-400QCs ordered by the Bolivian government for use by Transportes Aéreos Militares (literally "military air transports"), the domestic airline run by the Bolivian air force, are now stored at Woensdrecht air base, Holland.

According to Fokker BV, these aircraft are stored in the Netherlands pending a decision by the Dutch Ministry of Economic Affairs on a repeated request for Fokker to be allowed to export the aircraft. The two stored aircraft are officially Bolivian government property, as they have been handed over to them by Fokker. The export license for the 2 aircraft expired on 31 July 1980, before they could be delivered. On 28 October Fokker repeated its request for an export license, which has not yet been granted. The present Bolivian government (which came to power through a military coup) has demanded that these two aircraft are also delivered to them, or else they will consider non-delivery to be a breach of the contracts for the six (two contracts for three aircraft each) F.27-400QCs, four of which were delivered in 1979, before the military coup. The present government has said it will halt payments for the six aircraft. Fokker BV states that they are willing, and indeed anxious to deliver the two remaining aircraft, to fulfill their contractual obligations. Fokker BV is in contact with the Ministry of Economic Affairs, which in turn has informed Parliament of the desirability of going ahead with the delivery of the two aircraft.

It seems that the problem arises from Parliament's distrust of the present Bolivian government's intentions with the aircraft. One of the aircraft, at any rate, is painted in a jungle-type camouflage scheme (brown and green). This is the (intended) TAM-95, currently registered to Fokker BV as PH-FTV. The other aircraft, to be TAM-96, is registered to Fokker BV as PH-FTW. Parliament can disapprove of any Ministry of Economic Affairs decision to grant a new export licence, which could delay or permanently block delivery.

### FROM A FACILE PEN

#### First F-16 squadron combat ready

In October 1980 4 TFS of 388 TFW, Hill AFB, became combat ready on the F-16. The other combat squadron in the wing, 421 TFS, is expected to become combat ready in early 1981, while 16 TFS and 34TFS are committed to pilot training. 4 TFS is believed to be the first officially combat ready F-16 unit, and according to the USAF, the squadron is now capable of 'deployment to overseas locations'. May we suggest Cold Fire 1981 as a suitable opportunity for a trip to this side of the Atlantic?

#### RAFG replaces Wessex by Puma

On 1 December No.18 sqn, which had flown Wessex HC.2s from RAF Gütersloh since 1971, was relieved by No.230 Sqn equipped with Puma HC.1s. No.18 Sqn has been disbanded and its aircraft will be spread over the other RAF Wessex units. In late 1981 No.18 Sqn will reform at RAF Odiham in the UK with Chinook HC.1s, to be deployed to Germany. No.230 Sqn is expected to remain with RAFG for the next few years at least.

#### G.91 crashes in bad weather

On 28 October, a Fiat G.91 of LeKG-41, Husum, crashed into a field between Koldenbüttel and Ramstedt in Schleswig-Holstein, West Germany. The pilot was killed in the accident which happened in squally, rainy weather and low visibility. The aircraft was part of a formation on an instrument navigation flight.

#### Turkey gets ex-German Starfighters

Three ex-Bundesmarine F-104Gs were recently delivered to the Turkish air force (THK). An unspecified number of German Starfighters is due to go to Turkey as they are replaced by Tornados.





### 7th BW B-52s deploy to Upper Heyford

(RAF MILDENHALL, U.K.). Three B-52Ds of 7th BW at Carswell AFB, Texas, deployed to RAF Upper Heyford U.K., between 11 and 18 November. According to the USAF the deployment was used to practise the FOB (Forward Operating Base) concept. In times of conflict it is intended that B-52s will be based in Europe, so that they can fly combat missions without having to refuel in mid-air. The three 7 BW aircraft, 50090, 50113, and 60698, form the fifth flight of three B-52s to deploy to the UK last year. They have all been B-52Ds, from all three US based B-52D wings (7, 22, and 96 BW). 43 SW (Strategic Wing) also operates the type, but only on TDY (Temporary Duty) basis, with aircraft from the three US based wings under control of 60 BS, at Andersen AFB, Guam. B-52Gs have only been in Europe last year for the RAF Bombing Competition at RAF Marham in June and July 1980, when five aircraft from five wings participated. B-52Hs have not been reported at all. It would seem that the B-52D is seen as the most suitable version of the B-52 for European operations, although nothing has been heard in the last year of the plan to permanently detach 96 BW B-52Ds to RAF Marham in peace time.

### Dutch government decides on 22 F-16s

(DEN HAAG, HOLLAND). The Dutch government decided on 28 November to order eighteen F-16As and four F-16Bs. This batch of twenty-two is seen as a first batch in the purchase of thirty attrition aircraft (for the current batch of 102), and 81 aircraft to replace the survivors of the 105 NF-55s. Unless parliament disapproves, the twenty-two F-16s will be ordered to be built in Holland. Compared to the General Dynamics price, the twenty-two F-16s will cost DFL 59million more. This additional cost will now come from the future budgets of the Ministries of Defence, Economics, and Social Affairs (the latter two are to contribute because of the effect the order will have on the Dutch economy and on employment, respectively).

● As of 1 December Fokker had delivered thirty-eight F-16s. Twenty-one of these are Klu F-16As, and six Klu F-16Bs. The Norwegian air force (KNL) has received eight F-16As and three F-16Bs. According to the delivery schedules forty-one aircraft should have been delivered by 1 December. The delay of three aircraft was caused by slower delivery of F100 engines by Fabrique Nationale, due to a strike last summer (1980) at a subcontractor in the USA. The aircraft are being assembled according to schedule, but can only be finished and delivered when their engines are delivered to Fokker. The aircraft deliveries should be back to normal in mid-January, according to Fokker BV.

*Grim weather - heavy snow and sometimes overnight frosts followed by early morning fog, restricted the flying programme of No.20 Squadron RAF during a squadron-exchange with 525TFS USAF at Bitburg AB, West Germany. The Jaguars of No.20 Sqn operated from Bitburg AB from 3 till 11 December, helping the Eagles practise their air defence skills - and vice versa the Jaguars practise their air support skills.*

*On the lower photo, Major Bob Jessup briefs (left to right) Flying Officer John Newton, FL.Lt.Ian Milne, Lt.Herb Carlisle, FL.Lt.Andy Morris, and Sqn.Ldr.Mike Gray (RAF Germany)*



### Sea Harrier hits Invincible's ski ramp

(LONDON, UK). On 1 December a No.800 Sqn Sea Harrier FRS.1 made a low pass over the deck of the carrier HMS Invincible and hit the top of the ski ramp with its left hand outrigger gear. It is not clear from the reports whether this was retracted or not. The aircraft turned over and the pilot ejected safely, after which the aircraft hit the water and sank. The aircraft had taken off together with two other Sea Harrier FRS.1s from HMS Invincible, sailing somewhere in the English Channel, only minutes before the accident happened. It is not known why the aircraft made the manoeuvre that cost its demise. This is the first ever crash of a Sea Harrier. □



## 20TFW celebrates 50th anniversary

On Friday 14th November, the 20TFW celebrated 50 years of existence. Today's 20th Tactical Fighter Wing located at Upper Heyford, Oxfordshire, was designated the 20th Tactical Fighter Wing on 28th July 1947. Activated at Shaw Field, South Carolina, on August 15th 1947, the wing was temporarily bestowed the history and honours of the 20th Fighter Group. Conceived and authorised on the inactive list of the U.S. Army's Air Arm on 18th October 1927, the 20th Balloon Group was never activated.

In June 1929, this group was redesignated the 20th Pursuit Group and included the 55th, 77th, and 79th Pursuit Squadrons. These squadrons are still active with the wing today. The group was officially activated at Mather Field, California, on 15th November 1930, flying Boeing P-12 and later, P-26 aircraft.

Redesignated the 20th Fighter Group, it participated in the European Theatre of World War II, operating from King's Cliff, Northamptonshire, with P-38 Lightnings and later on P-51 Mustangs, flying a total of 15,862 combat sorties, 211 enemy aircraft were destroyed in the air and 232 on the ground. Pilots of the 20th also destroyed 400 locomotives, 230 freight wagons, and 94 ammunition wagons, earning the nickname 'The Locos'. The wing returned to the US in 1945 for deactivation.

In July 1946, the 20th Fighter Group was reactivated and at the dawn of the jet age, it retired its Mustangs and equipped with the F-84 Thunderjet. In 1957, the Thunderjets were replaced by F-100 Super Sabres, which flew with the wing until 1970, the last one departing from Upper Heyford on 12th February 1971.

Redesignated 20th Fighter Bomber Wing the wing moved from Langley AFB, Virginia, to Wethersfield, Essex in May 1952. In 1970, the wing moved to Upper Heyford and started preparations for the reception of General Dynamics F-111E variable geometry aircraft to replace the F-100 Super Sabres. Its first two F-111 aircraft arrived on 12 September 1970.

Celebration to mark the Golden Anniversary were kept very low key. On Friday November 14th, a giant birthday cake was cut at the NCO club. Several 20th TFW commanders were entertained as guests of honour, and the speaker for the evening was Major General Bazaley, Third Air Force Commander.

One wonders what the 20th will be flying in another 50 years, but one can be sure that it will be as different to the F-111s as that is to the P-12.

Barry Bailey-Hickman

*F-111E JR68-036 - squadron code of 55TFS/20TFW, and F-111E UH68-050 - wing code. (B.Ullings/API)*



SCOTTISH AIR NEWS is the journal of the Central Scotland Aviation Group. Published monthly, it is a professionally printed A5 magazine. An average 24 page issue contains photographs, current news and movements (both civil and military), updates on airline fleets, general and specialist articles, and much more. As an optional extra a 'Fly Over' section is also available. Our Sales Department stocks most publications, etc. Mail orders welcome. Excursions to various events are also organised. 1981 memberships details available from: A. McGeoch, Membership Secretary, 15 Guffock Road, Kirkconnel, Dumfries & Galloway, DG4 6QQ, Scotland.

Available, though some in very small amounts, are the following FLASH back-issues:

1977: April, May, June, July/August, September, October, November, and December

1978: January, March, September, October, and November

1979: January, February, May, September, October, and November

1980: March, June, July/August, September, October, November, and December.

Price per issue: DFL.2,50





Belgian F-16s participated in the Tactical Air Meet 1980. This participation characterized the progressing service entry of this type with the Belgian, Danish, Dutch, and Norwegian air forces.

## Remember from 1980?

The year of 1980 is over. Some decisions and events of 1980 will influence the course of things in forthcoming years.

The election of Reagan during 1980 will certainly have its effects on military aviation worldwide. Increase of operation costs, mainly due to the fuel prices, already had a bad influence on the airlines last year, but will undoubtedly grasp them too this year.

Its impossible to predict exactly what will happen to aviation in 1981, but some trends can be ascertained of having their roots in 1980.

### Increasing operation costs:

#### Problems with defence budgets

Increasing tensions in world politics started to show its reflection on the military aviation scene. Especially the U.S. deployment policy clearly responded to certain tensions in world politics. Whereas, since the introduction in 1975, US fighters

aircraft mainly deployed to Central Europe. In 1980 the deployments concentrated on Spain, Italy, and Turkey. Also Egypt was included with a deployment of F-4E Phantoms of 347TFW, and US Army helicopters of 101 Airborne Division.

With the introduction of President Reagan, the reflection will become even more clearly. Reagan has already indicated to issue a requirement for the B.1, or a new strategic bomber aircraft. Furthermore he intends to speed up the production of A-10s, F-15s, and F-16s, in an effort to answer the modernization programme in the Soviet forces.

The U.S. government is blaming the European NATO countries of not meeting their responsibilities in these periods of growing tension. All NATO countries had agreed to increase their defence budgets with 3% annually. For many, however, this proved impossible for 1980. In Belgium it led to a lack of fuel and participation in any exercises. In West Germany the costs of the Tornado, Alpha Jet and E-3 programme forced a reorientation of defence budgets for the next coming years. Turkey is nearly bankrupt and other NATO countries delivered surplus

military equipment on non-commercial terms. As a result 25 Dutch Starfighters exchanged the cold and wet climate for the mild and sunny climate of Turkey and confronted the true 1-0-4 freaks with the nearing end of this aircraft.

But there is no need to panic. The introduction of the new generation fighters is progressing steadily but the service entry of the Tornado is not expected before early 1983. The last Luftwaffe Geschwader to operate the F-104 will be JABOG-34, which is scheduled to receive the Tornado by late 1986. Even then the Starfighter freak can still enjoy the familiar howling sound from Italian and Turkish examples.

Ahead of the Tornado service entry, is the F-16. By November 1980, some 250 F-16s had been delivered worldwide, having accumulated some 34,000 hours. In 1981 USAF Europe will take delivery of its first F-16s with 50TFW at Hahn AB, W.Germany. Despite its complexity the service entry of the aircraft is progressing without serious problems. Of the eight accidents including F-16s so far, six have officially been reported to have been caused by maintenance errors, derivation from procedures, exceeding limitations. Despite scepticism over the Pratt & Whitney F.100 engine, in service the engine proved to be reliable. Although engine malfunctions were the reasons of five out of the eight accidents, the reasons were very different, i.e. wrong operation of fuel system, structural faults in welding part, a broken cable because of a non-lubricated turning point, false position of a compressor vane, and a false locking of a bearing.

For aviation freaks with little sentiments, the F-16 is a welcome novelty. In the air display at Farnborough test pilots from General Dynamics taught the audience a lesson in air manoeuvrability. In fact the entire air show at Farnborough was impressive. With the collection of many rare aircraft on display at the Newbury Air Rally at Greenham Common, this were the only two real highlights of the 1980 aviation events.

In the coming issues of FLASH the aviation agenda of 1981 is likely to include details on expected events as the Paris Air Show (France), the IAT 81 at Greenham Common (U.K.), the Tiger Meet at Bitburg AB (W.Germany), and the celebrations of 25 years Luftwaffe

JvT



## Increasing operation costs:

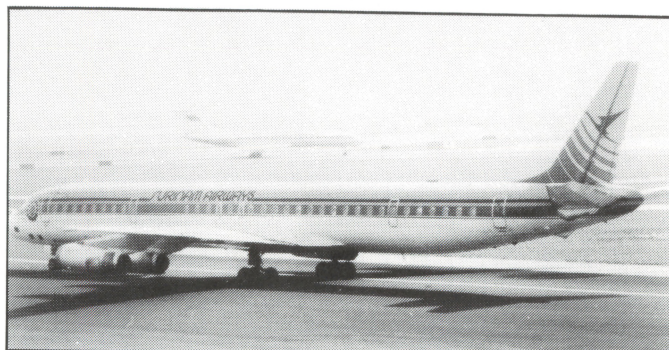
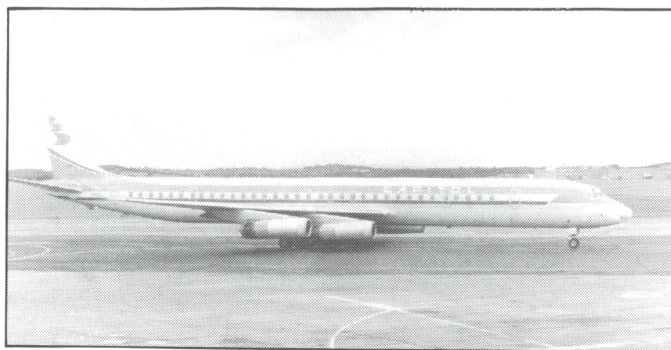
### Which airline to survive

With a few rare exceptions, 1980 was a bad year for the airlines. For a few it was disastrous. Aeral, Skyways Cargo Airways, British Cargo Airlines and Aerocondor (Colombia) are among those which bit the dust. Seaboard World Airlines has disappeared as well, having been devoured by Flying Tiger Line.

Many other airlines, in fact too many to list here, have suffered financial losses, forcing some of them to cut back on staff and/or routes. Notable examples of the latter are British Airways and Air UK, while Braniff has been selling off aircraft as well. Black spots among the charter airlines are Scandinavian companies, Spantax, and Aviaco.

Nevertheless there are airlines which have been doing quite well. Air Europe is a notable example, making a profit (in its second year in business) which was twice the amount made the year before, Cargolux is doing quite well, and has presently taken delivery of its second Boeing 747-2R7F (LX-ECV), offering a big increase in cargo carrying capacity aboard a fuel-efficient aircraft. Delta Airlines in the USA is perhaps the most consistent success story, as it is not only the second largest US airline, but hasn't made a loss in thirty-two years.

These profit and loss stories are academic as long as nobody looks at causes and remedies. One would have to search long and hard to find an airline manager who would deny it all has something to do with the rising price of oil. The increase means that (1) the airlines have to pay a lot more for their fuel, and put up their fares to compensate, and (2) people and businesses use aircraft less often, because they have less money to spend, which forces fares downwards. Profit margins are fast disappearing. This means costs must be cut, and fuel must be used more efficiently. The best equipped airline will survive, or at least stand a better chance. Therefore the DC-8-70 series, A.300 and A.310, Tristar 200 and 500, and Boeing 747 series



*To re-engine or not to re-engine...Yes, says Capital - DC-8-63CF N910CL at Shannon (David Gilligan). We are studying it, says KLM - DC-8-63 PH-DEM at Schiphol in Surinam Airways colours. When the DC-8-63s are re-engined, their designation will change into DC-8-73s.*

will remain bestsellers, and improve sales as the 1985 noise deadline approaches. And behind it all, still just beyond the horizon, hovers the reborn airship  
JJS

## Increasing operation costs:

### Turboprops preferred over Bizz-jets?

Of the European countries, France has the largest inventory concerning civil aircraft. Already 7,000 aircraft are flying in France, and the number is still increasing. During 1980, France showed an increase in aircraft enrolments with around 9½ percent. This percentage is equal to the overall European increase in enrolments. In France this is mainly due to the mass of new general aviation aircraft and homebuilts. Their popularity is likely to be maintained during 1981, and on. Germany showed an increase of its aircraft inventory too, but this is mainly due to the fact



*The first Canadair Challengers have been delivered in 1980. Will the demand for bizz-jets continue to increase in 1981?*

that most of the German air force's DO.27s were handed over to local aeroclubs, and therefore received civil registrations. During 1981 the last DO.27s will be handed over to aeroclubs and this is likely to cause a drop in enrolments, compared to last year.

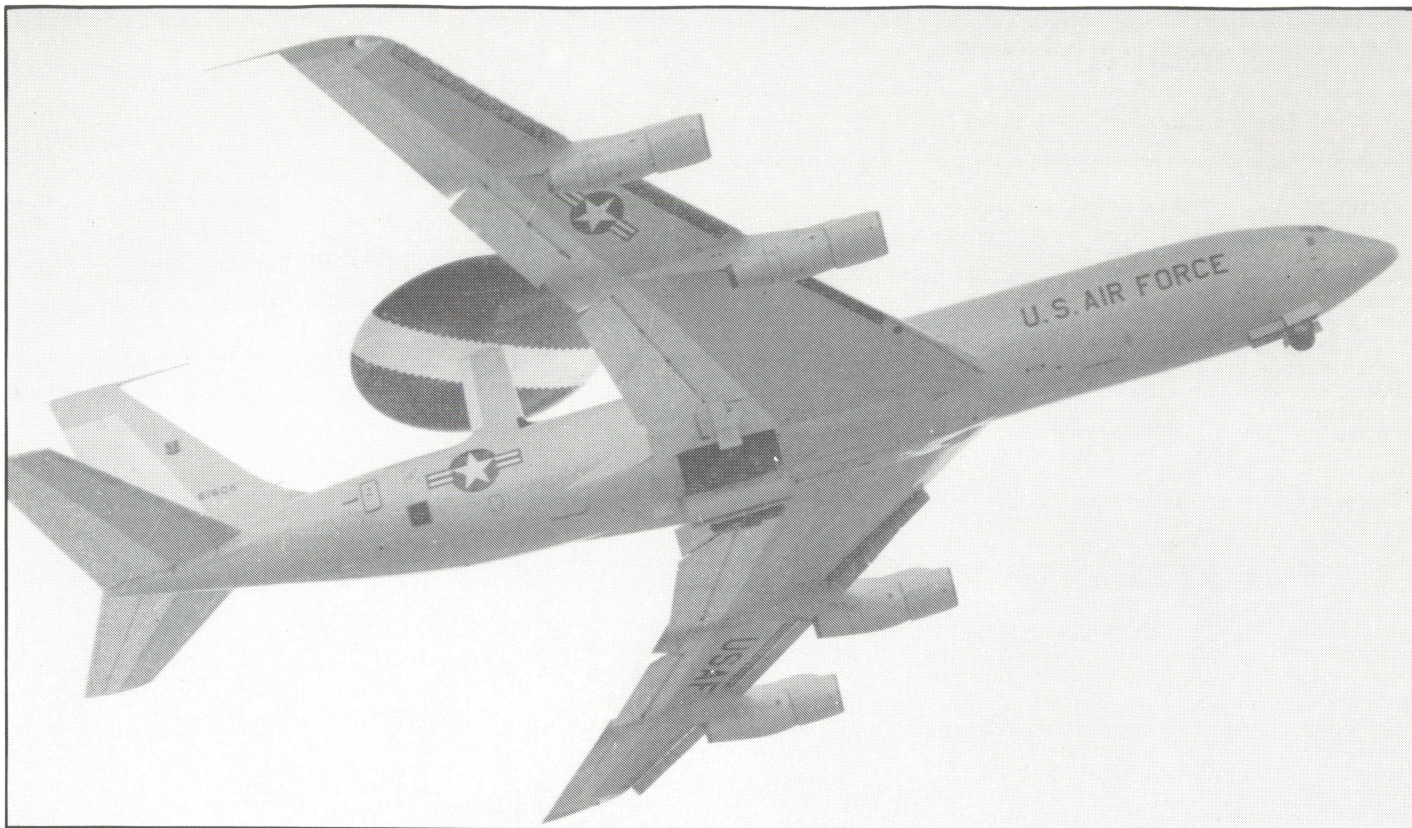
Noticeable for the United Kingdom during 1980, was that, although the total aircraft inventory did increase, new enrolments decreased from 110 aircraft per month to 40. The increase of the total aircraft inventory resulted from an even larger decrease in aircraft exports to the neighbour countries.

So far the increased aircraft operating costs didn't affect the general aviation market as much as was expected. However, more and more people became eager to buy second-hand aircraft with less powerful engines. Instead of demands for new aircraft, demands for second-hand Cubs and Cessna 150s increased.

The increased aircraft operating costs were, and still are a major concern to business aviation. Companies specialized in leasing bizzjets to industries have a hard time. Some of these companies went bankrupt during 1980, and more are likely due to if their policy isn't changed during this year. The change which could save a possible bankrupt, is the replacement of bizzjets by turbo prop aircraft aimed at business aviation, like Cheyennes and the Cessna 400-series of aircraft. Although, compared to bizzjet, the flying time increases considerably, the turboprop is still more fuelefficient, and is cheaper in handling and acquisition.

Still, the growth of business aircraft is more than any other civil aircraft market. Over 1980 the growth was 15 percent, but whether this percentage can be maintained in 1981, is yet to be seen.  
CvdH





*The Force Multiplier: USAF E-3A Sentry 61606 taking-off for another air surveillance sortie. (Boeing)*

## Extended ears and eyes for NATO's air defence

### First NATO E-3A Sentry to roll out on 27 January 1981

(MONS, BELGIUM). The airframe of the first NATO E-3A Sentry moved from the assembly line to the paint hangar at Boeing's manufacturing facility Renton, Washington, in November 1980. Here the aircraft was painted similarly to the basic colour scheme of the USAF E-3A, including USAF tail number. On the forward fuselage, however, the 'U.S. AIR FORCE' titling was replaced by 'OTAN-NATO'. In these markings the aircraft will be delivered to Dornier, West Germany on 25/26 March 1981. The USAF tail number is only provisional, and should be changed before delivery to NATO. The NATO's E-3A final markings are still a subject of discussion between lawyers whether NATO has sufficient legal personality to enable the organization to act as a 'nationality'.

*A clutter-free E-3 radar display, compared to a cluttered ground radar display.*



This small, and apparently insignificant problem is only one of the problems which have occurred since December 1978, when the Defence Ministers of NATO gave the go-ahead for a joint purchase of 18 Boeing E-3A Sentries.

The purchase of the E-3A was part of a \$ 1.83 billion (1977 dollars) programme to provide NATO with an own airborne early warning system to counter emerging low-altitude penetration threat possessed by the Warsaw Pact. The programme not only included 18 E-3As, but also 11 Nimrod AEW.3s being the U.K.'s contribution in kind.

### Air surveillance adds to interoperability

In the chain of command, the 29 air surveillance aircraft will be operated under the control of the Commander of NATO Airborne Early Warning Force (COMNAEWF), located at SHAPE headquarters, Mons, Belgium.

NAEWF is presently preparing to supervise the operations of this new element in NATO's air defence system. By 1985, when all 29 aircraft are scheduled to be operational, the NAEWF will be responsible for the long-range look-down radar system aboard both Nimrod AEW.3 and E-3A assisting fighters in their daily operational practise in air-to-air intercepts.

Interoperability is the key word. It is hoped that all elements of the air defence community will eventually be able to work together, said Major General Leighton R. Palmerton, USAF, present Commander of NAEWF, when asked how the E-3A will fit into NATO's air defence system. Not only the look-down radar capability of the E-3A is important, but also the mobility is considered a great asset for NATO's air defence community. MGen. Palmerton considers the E-3A worth its costs. It is what we call a force multiplier. Information can be selected from the air picture provided by the E-3A, in addition to the information provided by the ground radar stations. The mobility of the E-3A allows the force to concentrate in a particular area to provide full coverage, e.g. in areas of high threat such as North West Turkey, the Eastern Mediterranean, the Baltic Sea, and North Norway.



## A good aircraft, but not a miracle

Flying at 27,000 ft, the E-3A can monitor the airspace to a range of approximately 400 kms. The Westinghouse radar, mounted in the 9.1 mtr-diameter rotating radome, is carried atop of the E-3A. Every 10 seconds the antenna rotates 360°, providing the situation display consoles with 360° surveillance cover about the aircraft. On the display of these consoles, nine E-3A crew members are provided with information needed for surveillance, weapons direction, or other command and control tasks.

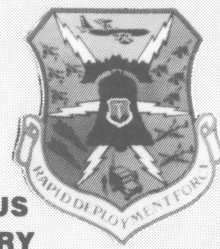
Because of the European environment in which the NATO E-3A will operate three special requirements were issued by NATO for the aircraft. To solve the problem of dense signal environment in Europe, IBM developed an improved version of the standard computer installed in the so-called 'Core' USAF E-3As. This improved computer operates nearly three times faster and has five times the memory capacity of the existing version. To meet the problem of electronic jamming, the newly developed Joint Tactical Information Distribution System (JTIDS) will be installed. JTIDS allows a large volume of information to be transmitted in seconds, enlarging the protection against jamming and eavesdropping. To meet a third specific European problem, the radar will have 'over-water' radar capability for NATO's maritime detection requirement.

All three additional requirements have, in the meantime, become part of the standard E-3A configuration, and the 'Core' E-3As presently operated by the USAF, will all be brought up to this NATO standard.

On a question on what Airborne Early Warning means for NATO, MGen. Palmerton commented that the E-3A represents an application of advanced technology. Not of new technology but of improving existing technology. The idea of AEW grew with the improving capability of an almost clutter-free look-down radar, and not because of the need for a control system for battle management, or dense traffic. The E-3A is a good aircraft but not a miracle. Its primary charter within NATO is air surveillance. Command and control responsibilities, as well as target identification, are on the ground and not on board the aircraft. The 'C' in AWACS (USAF system designation, ed.) refers to control, and specifically to the control function of directing air-to-air intercepts. This capability is also present in the NATO E-3As, but is secondary to the surveillance role. It also has an inherent capability of directing air-to-ground fighters to a target area, but the E-3A is not a Forward Air Control (FAC) aircraft. The aircraft can do a lot of things, but not all at the same time. In air-to-air intercepts, NATO E-3As can supply information and control the intercepts.



## PRESENT STATUS USAF E-3A SENTRY



Originally known as Airborne Warning and Control System (AWACS), the USAF has present 23 E-3As in operational service with 522 AW&CW at Tinker AFB, Oklahoma, with the hitherto last one delivered in December 1980. The USAF requirement stands for 34 aircraft of which 30 have been funded by Congress. It is planned to include three aircraft under each Fiscal Year budget.

The first E-3A Sentry was delivered to 522AW&CW in March 1977, and the wing achieved Initial Operational Capability in April 1978. In its short service life the E-3A has already proven its abilities. Some noticeable operational events during 1979 included:

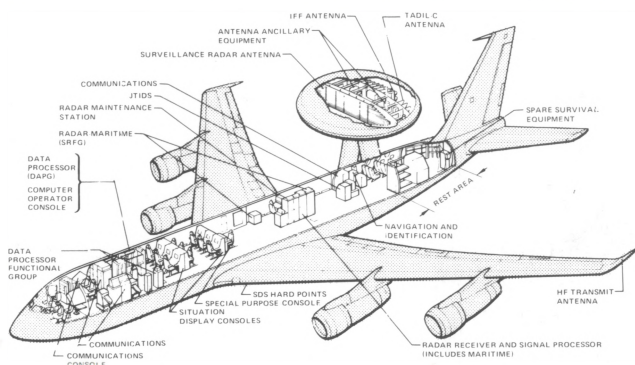
- Two E-3A aircraft were dispatched to Riyadh, Saudi Arabia during a period of tension between North and South Yemen.
- Aboard an E-3A aircraft, a U.S. Customs security air officer assisted in the detection, tracking and apprehension of an aircraft participating in aerial smuggling of drugs into the U.S.
- Two E-3A aircraft were dispatched to Osan AB, South Korea, during period of tension following the assassination of Korean President Park Chung Hee.
- An E-3A aircraft assisted in the rescue of two crewmembers of a Canadian Voodoo. Both aircraft participated in a joint US/Canadian exercise, and the E-3A remained over the area of the accident, after the fighter crew ejected and passed the accurate coordinates of the downed crew on to the ground control facility.
- The E-3A entered the annual SAC Bombing and Navigation competition to add a touch of realism. Operating in a wartime North American Air Defence (NORAD) surveillance and control role during the exercise the E-3 detected penetrating bombers and vectored an interceptor force of some 34 F-106 Delta Darts and F-4 Phantoms in for attack.

The first permanent E-3 detachment was established at Keflavik AB, Iceland in September 1979. The second one was established at Kadena AB, Okinawa, Japan, in July 1980. The third is planned for Elmendorf, Alaska, for 1982/1983.

*The first NATO-E-3A Sentry on the production-line at Boeing's Renton manufacturing facility. (Boeing)*







### THE TECHNICAL E-3A SENTRY

The E-3A aircraft is a modified Boeing 707-320B commercial aircraft. Besides the addition of a large, rotating radome to house its radar, identification friend or foe (IFF) and data link fighter control (TADIL-C) antennas, the airplane has been modified with four more powerful Pratt & Whitney TF-33 turbofan engines. The systems on board the E-3A can be divided into six basic functional groups:

#### SURVEILLANCE RADAR

The radar can be operated in six different modes and operates in the S-band. Its narrow beam width and extensive side lobe suppression makes the radar highly resistant to electronic counter-measures. The radar is operated from a console located half way down the fuselage.

#### IDENTIFICATION

Also mounted in the rotating radome is the identification antenna. Signals received by this antenna are directed to the Identification Friend of Foe (IFF) transmitter-receiver signal processor, which is located in the back of the fuselage. The information is sent to the situation display operator, and the control information is then returned to the signal processor for transmission.

#### DATA PROCESSING

The heart of this system is an IBM high speed computer with an input/output data rate of max. 710,000 words/sec. An interface analyzer unit interconnects functional data amongst E-3 avionics systems.

#### COMMUNICATIONS

Fourteen communication links are available for the exchange of internal communication with supporting air and ground mission elements. The computer is operated from a console in the front of the aircraft's fuselage.

#### NAVIGATION AND GUIDANCE

This subsystem provides (1) altitude references to the radar or target bearing and elevation, (2) altitude and position information, and (3) steering signals to the autopilot for accurate station keeping.

#### DATA DISPLAY AND CONTROL

Nine separate situation consoles are located in the middle of the fuselage in three rows of three consoles. The operator of a console can perform a number of activities related to the E-3 mission assignment, including selecting background data and targets for display, initiating tracking actions, controlling the type of data contained in a track block, transmitting information to the data processor.

### Main Operating Base for the E-3A Sentry

The total force of NAEWF will have two Main Operating Bases (MOBs). For the Nimrods this will be RAF Waddington, U.K., and for the E-3As Geilenkirchen, West Germany. The first E-3A is expected to arrive at Geilenkirchen in February 1982. Upon arrival the aircraft comes under NAEWF command. Initial Operational Capability of the E-3 fleet is expected for the second quarter of 1983, when six aircraft will have been delivered. The last aircraft will be delivered in mid-1985.

Rotating once every week, the E-3As will deploy to Forward Operating Bases or Forward Operating Locations. Although the names of these locations are still classified, the three FOBs are to be located in Italy, Greece and Turkey, and one FOL in Norway. The same goes for the Nimrods which will deploy to two FOBs in the U.K. The FOBs/FOLs will be rather austere bases, and will be built up gradually after Geilenkirchen becomes operational. For all heavy maintenance the aircraft at a FOB/FOL shall have to go back to Geilenkirchen. Once all 18 aircraft have been delivered, there will always be some aircraft at each FOL/FOB. Fall-back bases may be necessary in times of conflict, and the locations of these are being negotiated.

### New threats require new means to counter them

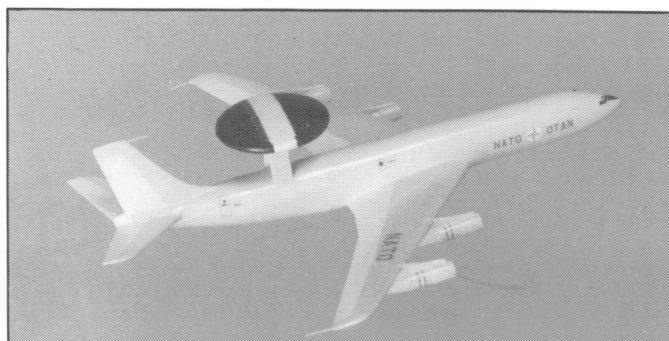
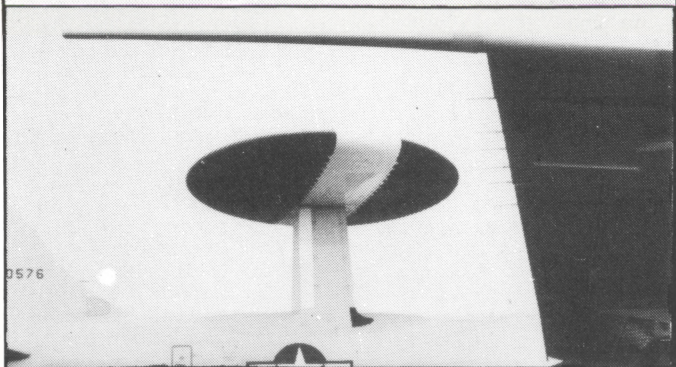
The ability to launch weapons from aircraft far from the target, and increasing aircraft speeds, are new developments in the Warsaw Pact as well, and require new counter measures. Fitting in the overall NATO air defence system, the E-3A adds the possibility to cover the radar gaps left by the ground radar stations because of the curvature of the earth.

The E-3A crew has six radar modes available to fulfil the air surveillance assignment. In the over-land mode the radar surveys airborne traffic only, using the Pulse-Doppler radar. To exclude moving ground objects from the radar display, e.g. cars, a speed threshold is set in the Doppler radar. In the maritime mode the Pulse radar is used, providing a radar display indicating all surface traffic. Another mode is called the interleaved mode, which is a combination of the maritime mode and the Pulse-Doppler non-elevation scan mode. The presented radar picture surveys ships, both moving and non-moving, and aircraft. The latter is presented without altitude information.

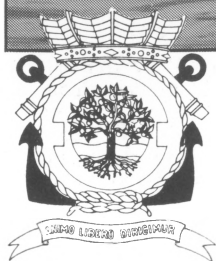
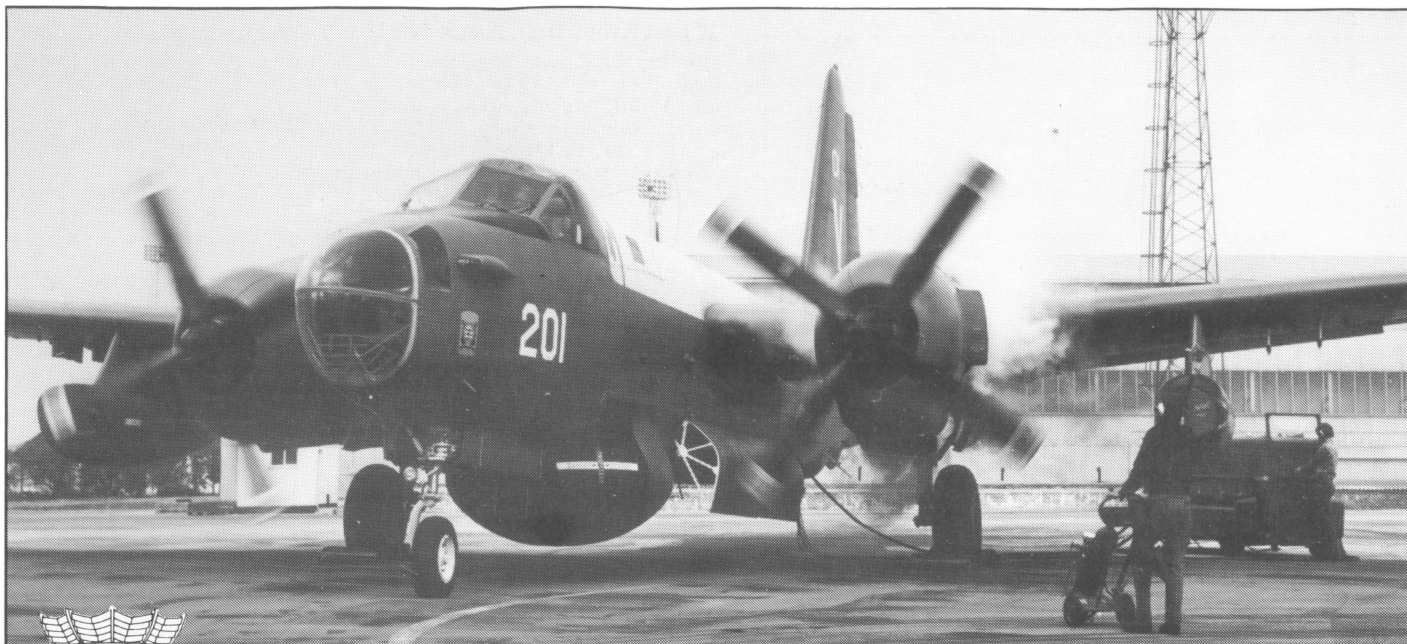
The original 'Core' E-3A had few over-water surveillance capabilities. According to the requirement, the NATO E-3A, however, will have these capabilities in order to operate over areas like the North Sea, Baltic Sea and Mediterranean. This capability is presently being evaluated both in the over-land optimized E-3A radar system, as well as the over-water optimized Nimrod AEW.3 radar system.

Probably the greatest advantage of the E-3A was recently demonstrated when four USAF aircraft deployed to Ramstein, West Germany. Under the control of Gen. B. Roger, Supreme Allied Commander Europe (SACEUR), the aircraft are operated along the border of West and East Germany, and supply information on any increase of military activities in relation with the tense situation in Poland. JvTC

According to this colour-scheme the first NATO E-3A Sentry was painted in November 1980. Since lawyers have not yet agreed on the legal personality of NATO, the aircraft will provisionally carry its USAF tail-number till delivered to Geilenkirchen in February 1982 (Boeing)







*A well-known sight at Valkenburg is the smoke coming of the Pratt and Whitney R.3350-32W piston engines when being started. A well-known sight which is about to disappear.  
(All photos: Kon.Marine/Audio Visuele Dienst)*

## Neptunes keep VSQ-320 going

(VALKENBURG, HOLLAND). There were two possibilities. Either to withdraw all Neptunes and disband Vliegtuig Squadron 320 (Aircraft Sqn 320), or to soldier on with the ageing Neptune till a new long-range maritime patrol aircraft could enter service. In 1974 the then Minister of Defence, Mr. H. Vredeling, was in favour of the first option. Because of the obsolete systems aboard the Neptune, the Minister reasoned, the aircraft's contribution to MLD's NATO requirement for surface surveillance was minimum. The Minister, therefore, suggested the disbandment of VSQ-320 in 1975, in order to re-activate the squadron in 1982 with the arrival of a replacement. The MLD, however, was in favor of the second option. For reasons as continuity, maintenance of infrastructures, and experiences, VSQ-320 was to be kept operational. Although of less value for its NATO assignment as sub-surface surveillance aircraft, it was considered to be feasible for the Neptune to remain in service till 1982. This way it would be possible to keep the VSQ-320's experienced personnel and its organization together. The MLD argument was considered to be realistic enough, and it was decided to continue the Neptune operations. VSQ-320 would remain operational, but with a demanding problem: how to keep the show going?

### Neptune has become less suitable for sub-surface surveillance

The Koninklijke Marine (Royal Netherlands Navy) has a NATO assignment for three naval escort task forces. Integrated part of these three forces, besides eight ships and a submarine each, is one maritime patrol aircraft. Together with VSQ-321, operating seven SP-13A Atlantics, VSQ-320 provides airborne surveillance for these three Dutch Naval escort task groups.

VSQ-320 operates from Valkenburg, north of Den Haag, and to meet its NATO assignment the squadron has nine Neptunes in service, of which one (217) is about to be withdrawn.

Of these nine aircraft, two are on a permanent detachment in the Netherlands Antilles, in the Caribbean Sea. Not only the amount of aircraft available for VSQ-320 is inadequate, the aircraft's search systems have been designed according to standards of the sixties.

According to Overste W.P. Boerop, commander and commanding officer of VSQ-320, the Neptune has become less suitable for sub-surface surveillance. As a result surface surveillance is emphasized by VSQ-320, and sub-surface surveillance is mainly done by VSQ-321.

The Neptune was originally designed for detection of diesel-electrically powered submarines. Detection of the new nuclear-powered submarines requires other means. Initially nuclear-powered submarine did produce some noise, but have become quieter ever since. The Atlantic is better equipped for detection of these submarines. But the P-3C Orion is even better, Overste Boerop added.

As commanding officer of VSQ-320, Overste Boerop is responsible to the Commanding officer of Group Maritime Patrol Aircraft. During peacetime the latter is in charge of the Neptune and Atlantic operations. VSQ-320 is tasked to be able to meet the operational status by training. An additional task for the squadron is the detachment at Hato, Curacao. The latter weighs heavily on the squadron, as the total amount of aircraft in service has been reduced from 15 to 8, and the number of Neptune crews from 12 to 6. Of these six crews, one is permanently stationed at Hato, and another crew rotates every three months.

The primary operational mission for VSQ-320 is surface and sub-surface surveillance. Exercising this kind of surveillance, the Neptunes are tasked to keep an eye on specific Warsaw Pact vessels. The collected information is passed on to naval intelligence, which receives similar information from all other NATO patrol units. Like a jigsaw puzzle the information is combined and results in a picture with locations of Warsaw Pact vessels at all times, new developments, and operational activities. This surveillance is done without concealment so NATO, in this case MLD, can show its capabilities to the Warsaw Pact. This so-called Naval Presence is practised mutually. There used to occur some incidents at such occasions, but over the years a code of conduct developed. The advantage of the free sea is the possibility to watch your potential enemy at close quarters. In the air this is hardly possible, and it is impossible on land. The disadvantage of the free sea, is that NATO exercises are necessarily interrupted when Warsaw Pact vessels are observing certain manoeuvres they are not supposed to see.

The Neptunes operate in a specific sector. Together with patrol aircraft from Norway, the U.K., the U.S., and sometimes from Canada or West Germany, the Neptunes patrol the North East Atlantic Ocean, between the North Cape, Norway, Iceland, the U.K. Compared to other sectors, in this sector the surveillance activities are more intense, because many ships of the Soviet Union's Murmansk-based fleet pass through this sector. When a group of





*Maintenance of the Neptunes is difficult due to rare spare parts, but, though it might take more time, without any concession the standard maintenance procedures are followed.*

ships leaves this Soviet harbour, the patrol aircraft are normally the first to spot the ships. The ships are watched by both aircraft and ships from respectively Norway, Holland, the U.K., and the U.S.

### **When maintenance costs have become too high the Orion will be there**

In September, the last Neptune was returned from a major overhaul. So now it is upto the maintenance personnel of VSQ-320 to keep the show going till mid-1982. Limited spare parts and even limited rare tools have increased the difficulty of maintenance work. When the aircraft entered service, major checks lasted a week, whereas these checks now last four weeks. Every time new items are included on the next inspection check list. After inspection the aircraft is cleared for 17 weeks, after which it returns again to maintenance.

LTJ1 F.A. Wiegerraad, lt. commander and maintenance officer of VSQ-320, assured us that there is no concession to be made whereas safety is concerned. During repair only standard procedures are followed. Only approved spare parts are used, which sometimes means they have to be custom made. In most cases, however, the spare parts can be taken from aircraft that have been withdrawn from service. The Neptunes which have been withdrawn most recently, are stored at Valkenburg where they dwindle day by day, as they are used to supply spare parts for the flying ones. The airframes of the operational Neptunes are still in good condition. The aircraft have been designed to meet an amount of hours expected to be flown during wartime. Since this is considerably higher than during peacetime, the aircraft's airframe still have many hours left. The average amount of hours flown by the Neptunes before withdrawal is around 6,100 hours.

Maintenance on the basic airframe is concentrated on corrosion control. The Neptune has a matt dark grey paint, which prevents reflections of the sun reducing the possibility of detection, but, on the other hand, stimulates the deposit of salt.

Overste W.J. Eiff, Commander and second in command of VSQ-320, added another aspect where the Neptune operations are facing some problems. Recently a Neptune was about to depart Valkenburg for Hato, Curacao, to relieve another Neptune. The route had been planned as Valkenburg - Sevilla (Spain) - Dakar (Senegal) - Belem (Brasil) - Hato. Just prior to departure a telex was received from Sevilla, that F-2 fuel was no longer available. Immediately inquiries to a number of airfields in the area revealed that F-2 fuel was available at Lajes, Azores. Luckily the flight plan could be altered and the aircraft could fly via Lajes.

In Holland the F-2 fuel (115-145 octane petrol) is specially prepared for the MLD. The alternative fuel for the old Pratt & Whitney piston engines is 100-130 octane petrol. A mixed use of both fuels, however, raises problems with tolerances on the engines, as Pratt & Whitney based these tolerances on F-2 fuel.

Affirming it will take more effort as time rolls on, LTJ1 Wiegerraad assured the quality of the maintenance will be maintained. This means Neptunes will have to be withdrawn one by one until the first Orion arrives. The reduction might continue, if necessary, till only two or even one aircraft is left.

### **Old Neptune sentiments replaced by Orion automatic data processors**

It had been considered to submit the Neptunes to a mid-life conversion. Considerations such as increased payload and costs presented these intentions to become reality. The systems in the Neptune are integrated and can not easily be updated. In all those years only the navigation systems have been improved. The installation of an Omega navigation system was necessary, when the existing LORAN-A stations were phased out. The Omega system is more accurate in pinpointing the aircraft's position.

*Four Neptunes (V209, 211, 213, and 215) have been withdrawn from use, and stored at Valkenburg to be used for spare parts.*







*Corrosion control is essential for aircraft operating over sea. Washing the aircraft is one of the items of corrosion control.*

This is essential on long-range flights such as those to Hato, or when passing on coordinates to friendly ships after having located a target. As mentioned before, the shortfall of the Neptune was in sub-surface surveillance mainly. Although more and more attention is paid these days to surface surveillance, it is sub-surface surveillance that is practised mostly, because of the degree of difficulty. To meet this shortfall a replacement was needed in 1975, but it will be mid-1982, when the first P-3C Orion Update II will arrive at Valkenburg. By then the Neptune will have been in service with VSQ-320 for twenty years (including the P2V-5 Neptune version), and it is not surprising

Neptunes V210 and V204 in formation over the Dutch coastline. The aircraft are different in two ways. V210 is a P-2H with a solid nose, while V204 is a SP-2H with a glazed nose. All MLD Neptunes were modified with a glazed nose in 1964. V210 has been applied with a white upper fuselage. The white paint reduces the temperature in the aircraft with 15°C when submitted to a tropical sun. This white upperside was introduced when the Neptunes were based in New Guinea. In 1962 the Neptunes were handed over to VSQ-320 and moved to Valkenburg, where the aircraft were painted in dark grey all over. In 1974 the white upperside was reintroduced with the detachment of three Neptunes of VSQ-320 at Hato, Curacao.



that a lot of affection is felt in the squadron for the type. The loss of the (romantic) Neptune is, however, considered to be well compensated for by the gain of the (challenging) P-3C Orion. The equipment on the P-3C Orion has no great innovations whereas sensors are concerned. Compared to the Neptune, and to a lesser extent the Atlantic, the Orion is a great innovation in automatic data processing. As a result processed data will be more accurate, and the crew will be able to work better. When operational on the Orion, the mission assignment for VSQ-320 remains unchanged. Execution of the mission depends on the aircraft, and compared to the Neptune, the Orion will be able to contribute more to the execution of its mission. For the commanding officer of the Group Maritime Patrol Aircraft, the choice remains which aircraft (Atlantic of VSQ-321, or Orion of VSQ-320) to be used for which mission.

At the time the Orion was selected to replace the Neptune, the standard version was the Update II. The retrofits in the Orion are mainly on the data processing capabilities, of which new applications are developed almost every day. The U.S. Navy, for example, already operates an Update III version. The MLD too will keep its Orions up-to-date. Updates will be made parallel to the US Navy when possible, although the MLD will also include its own updates. Presently it is being considered whether to equip the MLD P-3 with a different Omega navigation system as installed in the U.S. Navy P-3s. Since 1979 no crews are being trained for the Neptune, and currently VSQ-320 has six crews available to fly the Neptune. Four of these crews will go to NAS Jacksonville, Florida, U.S.A. for type conversion training. This will be in late 1981, when the first MLD P-3C Orion will be delivered from Lockheed's facility at Burbank, to Jacksonville. The crews will train on three MLD aircraft during early 1982, and upon completion of this conversion training, fly the three aircraft to Valkenburg. According to Overste Boerop all attention is focussed on the P-3C Orion at the moment. The old Neptune is no longer in the lime-light, which demands extra attention so as not to become too indifferent to the aircraft. The quality within the aircraft has to be maintained.

The attention on the Neptune is concentrating on the destination of the aircraft once withdrawn. Some will have been cannibalized for spare parts too such an extent, that the only destination can be the scrapheap. A more worthy destination for two Neptunes will be a monument at Valkenburg (216) and a place in the Netherlands air force museum at Soesterberg. Requests for a Neptune have been received from the U.K. and Canada.

JvTD





## AIRLINE NEWS

### Itavia to cease operations

(ROMA, ITALY). Itavia is the second privately-owned Italian airline to cease operations in less than a month. On 10 December the curtain was rung down for the airline, which operated mainly charter and mail flights, as well as few scheduled services, using four DC-9-15s, two DC-9-32s and three Fokker F.28s. The crash of a DC-9-15 of the airline last summer seems to have led to the collapse of the airline, which had been ailing financially before then. The management states that the airline had been operating flights for the Italian government (e.g. mail) at a loss 'in the public' interest. The airline's pilots, through their union, have complained of government favoritism, benefiting Alitalia (partly state-owned), and damaging the private airlines (Aeral and Itavia). Aeral ceased operations recently amid management statements alleging similar anti-private airline policies. It should be noted that Alitalia also operates flights in the public interest. For example, after the recent earthquake in Southern Italy, Alitalia flew natives of the area, living in Holland, from Schiphol to Italy, and if required, back to Schiphol, at no cost to the passengers.

### Transavia leasing schedule

(SCHIPHOL, HOLLAND). Transavia Holland plans to lease out most of its Boeing 737s at various times till 1 April 1983. Currently PH-TVD, a 737-2K2C is wet-leased to Air Djibouti (till 1 April 1981, option to extend till 1 April 1982). PH-TVE, also a 737-2K2C, is with Air Malta till 31 March 1983. Boeing 737-222 PH-TVH is on lease to Air Florida till 31 March 1981, together with 737-222 PH-TVI (since 20 December 1980) till 30 April 1980. On 1 April 1981 two aircraft go to Air Malta, both till 1 April 1983. These are PH-TVC, a 737-2K2C, which is a wet-lease, and 737-2K2 PH-TVP.

The fleet will be reinforced in the summer by an Air Florida 737 (1 May till 26 October 1981). There are no plans to lease out the 707-123B (PH-TVA) which means that on average one 707 and three to four 737s will be available for Transavia flights in the winter season, and one 707 and five to six 737s in the summer.

### Chautauqua Airlines orders two Shorts 360s

(BELFAST, NORTHERN IRELAND, U.K.). On 13 November the second order for Shorts 360s was placed. Chautauqua Airlines, a commuter airline based at Jamestown, New York State, USA, ordered two 360s for delivery in 1983. Chautauqua Airlines is an Allegheny Group member and operates two Shorts 330s already.

Total 360 orders now stand at six, a figure reached in four months after the project was announced. First flight is expected in late 1981.

CAAC 747SP B-2442 landing at Gatwick recently. CAAC services to the UK were finally started in late November 1980. (Frank Struben)





## KLM receives US-registered 747, and sells Bo105

(SCHIPHOL, HOLLAND). On 15 December Boeing 747-206B N1298E arrived at Schiphol, and was moved into a maintenance hangar for Post Delivery Modification (PDM). The aircraft was expected to be ready on 24 December, so that it could fly its first scheduled flight on Christmas Day. N1298E is the second US-registered 747 of KLM, N1295E having been delivered on 12 September. The aircraft, as well as 747-206B(SCD) N1301E, to be delivered in October 1981, have been bought by KLM by means of a financing arrangement with a US consortium of banks. A condition of the arrangement was that the aircraft remain US-registered. Similar deals have been made by Air France (747s) and UTA (DC-10s). All this has no effect on the operations of the three 747s, as FAA rules generally are applied by the RLD (Holland's equivalent of the FAA) as well, and where this is not the case, RLD rules apply equally to Dutch and foreign-registered aircraft operating in Holland.

KLM helicopters has sold Bo.105C PH-NZJ to Aerogulf in Dubai. PH-NZH is on a long-term lease to AGIP, an Italian oil company, which uses the aircraft to support operations in South Yemen. The Bo.105Cs became redundant, in effect when the two Sikorsky S.76As were delivered, although these had originally been intended as replacements of PH-NZE, the S.58ET.

The S.76As are 12-seaters, while the Bo.105Cs seat only four passengers at maximum (with one passenger in the co-pilot seat).

On the other hand, KLM Helicopters has reduced its current fleet of (28-seater) S.61Ns by three, in that one is leased to Management Aviation, Ltd. U.K. till October 1981, and one to the same company on a contract of undetermined length, which can be cancelled by either party after giving three month's notice. The third one is leased to BCAL, also on a mutual three month's notice contract. The reason for this reduction in S.61N capacity is that recently the North Sea exploration has moved closer to the Dutch coast, which means shorter support flights, less hours for the fleet, and excess capacity. However, should the support flights get longer again, then KLM Helicopters can get two of the S.61Ns back in operation in three month's time. □

right : F.28 Vh-FKF (ex PH-MAT) just after delivery to Ansett Airlines, Australia on 1-10-80. (TJochems)  
Bottom: From 6 August to 6 September four new 747s have been delivered to Garuda. The picture shows PK-GSA (front) and PK-GSC/GSB (back) at Jakarta on 1 September. (API/B. Ullings)

## FROM AN AIRLINE PEN

### Aviaco leaves Irish out in the cold

Aviaco are reported to have ceased operations to Dublin. This left some 600 Irish tourists stuck, mainly at Las Palmas de Gran Canaria, Spain, who had to be flown back by hurriedly organized Aer Lingus flights.

### PanAm 707s withdrawn from use

PanAm withdrew all its remaining Boeing 707s from service on 1 December. The aircraft have become redundant now that six L.1011-500s have been delivered (another four to come) and the airline market isn't getting much bigger. The 707s are available for sale or lease, as well as the four ex-National DC-10-30s and some, if not all, 727-21s and 727-35s (the latter ex-National as well). Furthermore some 747-12As are available.

### Bangladesh Biman advertises for 707 but gets a DC-8

In Flight International of 25 October an advertisement appeared of Bangladesh Biman, expressing the airline's wish 'to wet-lease a B 707-320C aircraft for period 20 November '80 to 31 March '81'. On 17 December 707'349C EI-ASO, till very recently leased to Bangladesh Biman, was reported to be at Dublin for an inspection, but not to return to Bangladesh. Meanwhile, back at Schiphol, on 28 November, DC-8-53 LX-IDB had appeared, wearing Bangladesh Biman insignia. This may seem confusing, but it does look like Bangladesh Biman didn't get its wish fulfilled, but was haled out by LX-IDB's owners, TAG International, at the last minute. Why Aer Lingus pulled out remains unclear.







## Tiger Moth flying

### It's an old fashioned love song

(TEUGE, HOLLAND). In a bent shelter, with a brand-new Tobago pushed aside, we spot two Tiger Moths which are bound to fly today. "Take care not to hit the bow of the shelter with the upperwing" warned Jaap Mesdag, "Just watch the upperwing, the lower one will follow automatically", he added. Jaap Mesdag is one of the members of the 'Early Birds', a group which owns one of the Tiger Moths, the camouflaged one which we pushed out of the shelter into the grass of Teuge airfield.

When parked at the grass, the aircraft is thoroughly cleaned, every fly still hanging on from the Tiger Moth's latest trip is wiped off. Afterwards Jan de Vries, also member of the 'Early Birds', checks the engine and oil level. Jaap Mesdag meanwhile climbs on the Tiger Moth and refills the fuel tank which is placed in between the upper wing. The fuel tank is drawn off from water which is eventually present. Jan de Vries notices a leak in the exhaust system due to corrosion. "Don't mind, we have a spare as this is one of the parts that regularly breaks down". After twenty minutes hardwork, the Tiger Moth is ready for a next flight, and we push the aircraft across the field heading the grass runway. Halfway down the taxi-path we enter a field covered with manure. "That's why we don't taxi on engine power, the prop would spoil our cleaning". Near the runway the tailwheel is removed, it only acted to ease the taxiing and to prevent damage to the hardened paths due to the tailskid. The last checks are made and Jaap Mesdag steps into the driver's seat. With his small posture it is easy for him to get in, but he barely sticks out of the open cockpit which results in low visibility while taxiing. "Contact off", shouts Jan de Vries, after which he builds up pressure with the propellor. "Contact", the first swing of the propellor is in vain. At the second attempt, however, the old familiar sound of the Gipsy Major engine is heard. The aileron, elevator, and rudder are checked on their behaviour. Jan de Vries buckles himself in the front seat and the

Tiger Moth staggers to the runway. Full power is given and the aircraft runs to its untimely take off. After a short time the biplane's silhouette is outlined against the grey air.

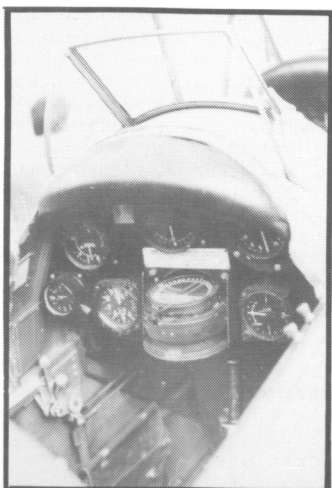
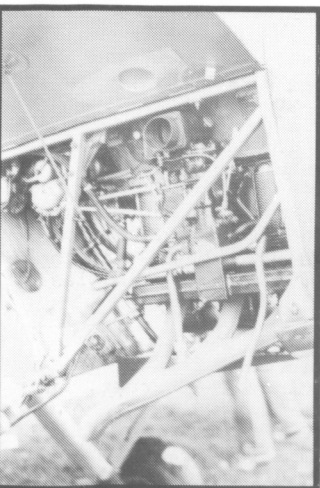
*The Tobago: elegance and personal comfort.  
The Tiger Moth: It never heard of the word elegance, nor personal comfort. What moves pilots not to take off in the new and very well equipped Tobago but instead take off in an old uncomfortable aircraft like the Tiger Moth?*

With the Tiger Moth still in the air, we see that Mr. Smeitink prepares his aircraft, the other Tiger Moth, painted white with red cheatlines, too. Returning from his first hop, Jaap Mesdag parks his Tiger Moth along Mr. Smeitink's aircraft. Now it is our turn to take a ride. Jan de Vries lends his thick gloves to protect one's hands against the cold. After the pre-flight briefing we got in our airplanes. "Take care not to damage a thing", said Mr. Smeitink, who was concerned about his fragile aircraft. "Don't let the side doors fall free, they easily ruin the fabric". Unfortunately there wouldn't be any conversation during the flight as the headphone was broken, and it's quite impossible to talk to each other in an open tandem cockpit. The prop was swung and the engine started, a final run-up check and full power. The tail-skid bounced against the grass but within 200 metres Mr. Smeitink took off. We were followed calmly by Jaap Mesdag who manoeuvred his aircraft in excellent photo-positions. But before taking pictures we enjoyed flying in the open air, with an aircraft of nearly forty years old. The wind was all around, it went through the clothes and sneaked between your back and the seat. At such moments you wish that it could last forever.

It is barely impossible to describe flying in a Tiger Moth or other such vintage aircraft, but don't forget that the flying time is only a tenth part of such aircraft's lives. Most time and effort has to be put in maintenance, overhaul and care for the aircraft, care to keep up memories of the old flying days.

CvdH









Boeing 747 PH-BUI during the last stage of its major overhaul last year.

## KLM's maintenance share in KSSU

(SCHIPHOL, HOLLAND). The more observant people who spent a day at Schiphol Airport on Monday, 13 October 1980 will undoubtedly have noticed the arrival of three new Boeing 747s of Garuda Indonesian Airways. It will also have been noticed that they came from Jeddah, Saudi Arabia, and that they positioned back to Jeddah on 25 October. In the thirteen days which they spent on the ground they were in the tender care of KLM.

KSSU is one of the reasons why these aircraft, and many other 747s, are regularly seen at the maintenance facilities of KLM.

### Why KSSU

KSSU, a pooling-of-resources organization formed by KLM, SAS, Swissair, and UTA, is a logical result of an historical development. In 1967 KLM, SAS, and Swissair were among the initial customers for the Boeing 747, which was a vast step forward as far as airliners was concerned. Not only was the aircraft much larger than previous airliners, it was also much more expensive, and to a certain extent more complex, in that it needed more people and scaled-up facilities to operate and maintain it. Indeed, there was a spate of building or adapting of hangars around the world in the late sixties.

Because, initially at least, the 747 was ordered in very small numbers (KLM ordered three 747-206Bs, Swissair four -257Bs, two of which were cancelled, and SAS two -283Bs), the cost of giving these few aircraft major overhauls at each airline's own maintenance base would be very high, considering the special equipment needed. This equipment would not be used for months on end, should it only be used for the handful of 747s each airline owned. Therefore KLM, SAS and Swissair decided in 1969 to pool their resources and share out the work in a rational manner.

As the same argument applied to the new generation Pratt and Whitney JT9D turbofans which powered the 747s, these were included in the KSSU agreement. KLM was given responsibility for the major overhauls of the seven 747s, while SAS got a similar responsibility for the JT9Ds.

Swissair would get airframe overhaul responsibility for the next aircraft to be included in the KSSU scheme, which turned out to be the DC-10. This type was also bought by UTA, the French independent airline, which joined KSSU in 1970, making it KSSU.

### KSSU today

The consortium's partners now have three types of wide-body airliners in service, using two types of turbofans. KLM overhauls all Boeing 747s and General Electric CF6-50 series engines. SAS does the overhauls on the JT9D engines, while Swissair takes care of the DC-10s. Finally, UTA's subsidiary UTA Industries is responsible for major components, such as the landing gears and APUs for both 747s and DC-10s. SAS also overhauls its own Airbus A.300s, and will later on also take care of the A.310s (SAS is the only KSSU member operating A.300s).

When asked how all this work is paid for, Ir.K.H. Ledebor, head of KLM's Technische Dienst (Engineering and Maintenance Division), replied that, as far as labour is concerned, within KSSU no money as such is exchanged. Settlement is based on the principle of pooling. This means that the partners swap labour amongst themselves in 'packages' of equal value. Exchange of parts and components is settled at regular intervals, and differences are made good by payment. The idea behind KSSU is that it should save money, not cost money.

Ir.Ledebor said that KSSU is an organization in its own right. It exists by means of a thick book full of rules and a continuous series of conferences. Each of these standing conferences has four members, one from each airline. The conferences cover such diverse, but equally important, matters as legal and financial advice, long term planning, and technical policy (i.e. maintenance).

### KLM in KSSU

As mentioned above, KLM's share in KSSU consists mainly of major overhaul on the KSSU partner's Boeing 747s and CF6 engines. This means also that KLM controls the exchange of the majority of spare



parts and of information as far as the 747 and CF6 are concerned.

No less than 300 CF6 engines are now KLM's responsibility, and this figure is still rising. This includes spare engines. Just how important these engines are is clear (quite apart from the fact that an engineless DC-10 or 747 won't fly) from a look inside the CF6 workshops at Schiphol-Oost, where at any given time more than ten CF6s are in various stages of overhaul.

Nevertheless it is the major overhaul of a 747 which takes up most space and indeed looks most spectacular. KLM's maintenance hangar no.11 has one bay committed to the major overhaul of 747s (one at a time). In all 43 747s get their major overhauls, or E-checks after four years of operations, at Schiphol-Oost, a figure which is expected to rise to 65 by 1984. Of the 43 currently under the care of KLM, fifteen are operated by KLM, ten by the other partners, and the remaining eighteen by third parties, such as Garuda and Thai International. These two airlines have fairly recently become 747 operators, and illustrate why these and other non-KSSU member's 747s are overhauled at Schiphol-Oost.

Thai International's first 747 was delivered in November 1979, not to Bangkok, but to Schiphol, where KLM put the aircraft through a Post Delivery Modification programme. PDMs are modifications or installations (such as pantries, seats, and other interior furnishings) which make the aircraft suitable for the particular needs of the airline, but which the manufacturer would do for commercial prices, whereas the airline can do it for cost price. But since Thai International doesn't have the facilities to do this kind of work on its 747s, and does have a technical cooperation contract with KSSU partner SAS, the Asain airline decided to have SAS arrange a PDM programme. The work was passed on to KLM, which has 747 responsibility (and, hence, experience), and SAS 'paid' for this work in the usual manner, as arranged under the KSSU rules. Similarly, Garuda's first three 747s, delivered during August 1980, came to Schiphol for interior work, after flying thousands of Moslem pilgrims from Indonesia to Jeddah, September and the first half of October being 1980's peak time for inbound Hadjis. Garuda has a technical cooperation contract with KLM.

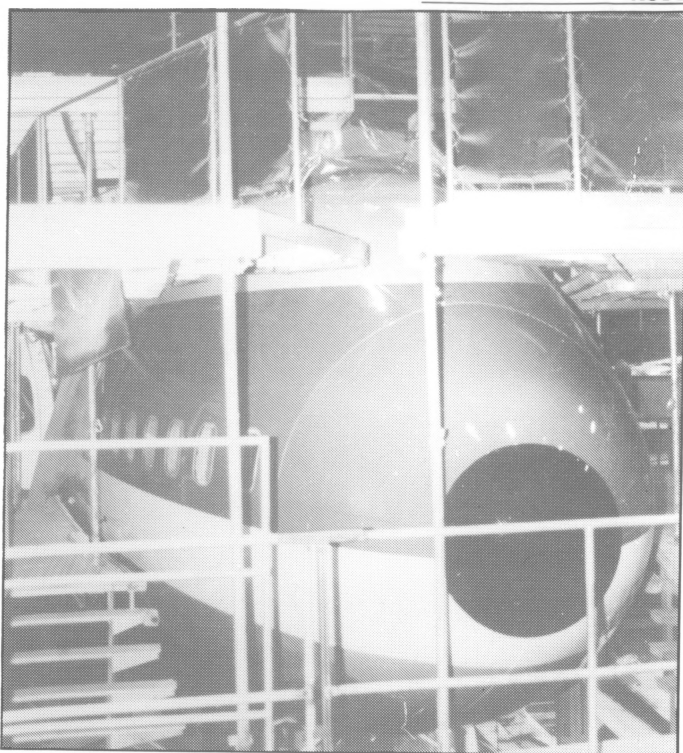
Garuda and Thai International are just two examples of airlines which have bilateral contracts with individual KSSU members. Others are PIA, VIASA and Martinair Holland, which have contracts with KLM, and Air Afrique (contract with UTA). They don't have contracts with KSSU as such, but obviously they benefit from the specialization and experience within KSSU. For example, if any problem arises at Schiphol with a VIASA DC-10, KLM can call on Swissair's DC-10 experts to put things right.

The major, and as mentioned above most spectacular work done on 747s by KLM, is the E-check, or major overhaul. This is the specific KSSU task for KLM, as far as airframes are concerned. The photos illustrating this article have been made in the 747 E-check bay in hangar No.11, showing KLM's 747-206B(SCD) PH-BUI which was in the later stages of its E-check.

The aircraft was jacked up off the hangar floor, and a vast horde of KLM mechanics were putting various moving parts back into the aircraft, such as the surprisingly small aileron used during cruise flight (a larger aileron nearer the wingtip is used for approach and climbout).

The landing gear had already been put back on, but dangled somewhat helplessly as if the plane was reaching for terra firma. In fact it was as safe on the jacks as on its own wheels, if not safer. However, the aircraft was still full of (officially approved) holes, where soon the windows, emergency exits, passenger doors, and last but definitely not least, the 3.05m by 3.40m (10ft by 11ft 2in) side cargo door would be installed. Inside, the cabin lacked most of its normal interior furnishing, revealing the seemingly chaotic, but actually well designed and functional mass of wiring and tubing needed to keep the aircraft flying well.

It was clear that the 747 is not only a very large aircraft, it is also a three storey one; at the top the cockpit and upper passenger cabin, in the

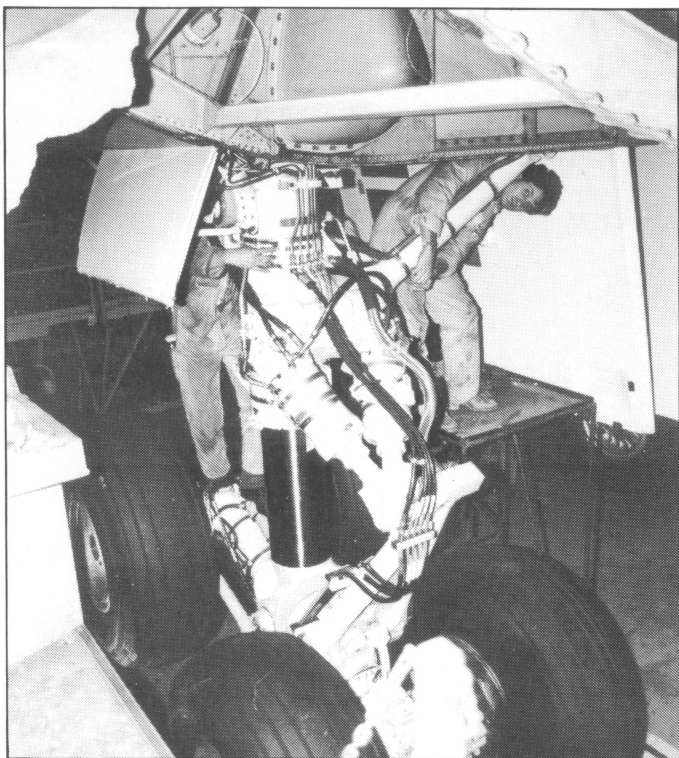


Top : The nose of the 747 surrounded by stages.  
Middle : The aileron used during cruise flights coming in for assembly.  
Bottom : The interior of the Boeing 747 .





Hangar 12 (left, completed last year) is used for minor checks and maintenance, while hangar 11 (right) is used for KSSU 747's major overhauls.



middle the main cabin, and downstairs the cargo hold, as well as an electronics/avionics compartment underneath the forward (first-class) cabine. People were working on all three levels inside the aircraft, as well as outside, giving the entire scene an anthill-like look. The high level of activity is explained by the obvious fact that an airliner should spend as little time as possible in the hangar for an E-check (when it isn't earning the airline any money), while still ensuring that all the necessary work is done well. What perhaps may have lent the scene its hyper-active appearance was the fact that although for example one engine still had to be installed, it was planned to lower the aircraft onto its own wheels and fuel it up (to check for any leaks) later that evening.

### The future for KSSU

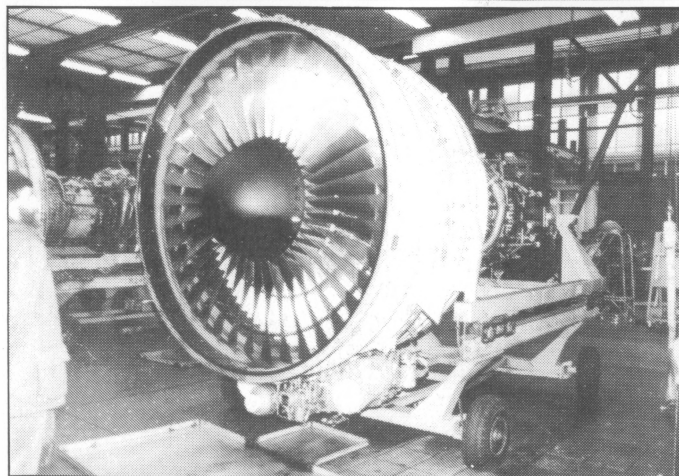
When asked what problem, if any, occupied the minds of the KSSU members mostly, Ir.Ledeboer replied that there were no specific problems that worried KSSU. What does get a lot of attention is the preparation for the Airbus A.310, which is very exciting and interesting, and is seen as a new proof for the cooperation in KSSU.

In all twenty A.310s have been ordered by KLM and Swissair (ten each). Furthermore five more (two Air Afrique and three Martinair) are likely to get their E-checks at the KSSU A.310 airframe facility, which will be SAS's responsibility.

Another new type, if one can call it that, which KLM will add to its list of airframes, is the 747SUD (Stretched Upper Deck), four of which have been ordered by Swissair. No further new types are envisaged at the moment for inclusion in the KSSU agreement, but as soon as any of the partners decides to buy a new type, this will be notified to KSSU, and it is quite probable that UTA will get airframe responsibility for this next type.

It may be interesting to note that although DC-8s and DC-9s are operated by several KSSU airlines, these older types are not included in the KSSU agreement. This is mainly because the airlines had already invested in their own overhaul facilities earlier in the sixties, or, in the cases of SAS, Swissair, and KLM, already concluded separate bilateral agreements, which the KSSU partners didn't feel the need to disturb.

Recently the KSSU agreement, which had an initial limit of ten years, was renewed for an undetermined period, but not less than three years. This is not surprising since KSSU saves the members some 10% to 15% in overhaul costs, and renders an incalculable 'amount' in know-how and safety. KSSU is good for KLM and its partners, as well as many airlines outside KSSU which make use of its 'members' facilities. JJS



Middle : One of the landinggears of the Boeing 747 hanging in the air.

Bottom : One of the CF-6 engines which are overhauled by KLM for the KSSU group.



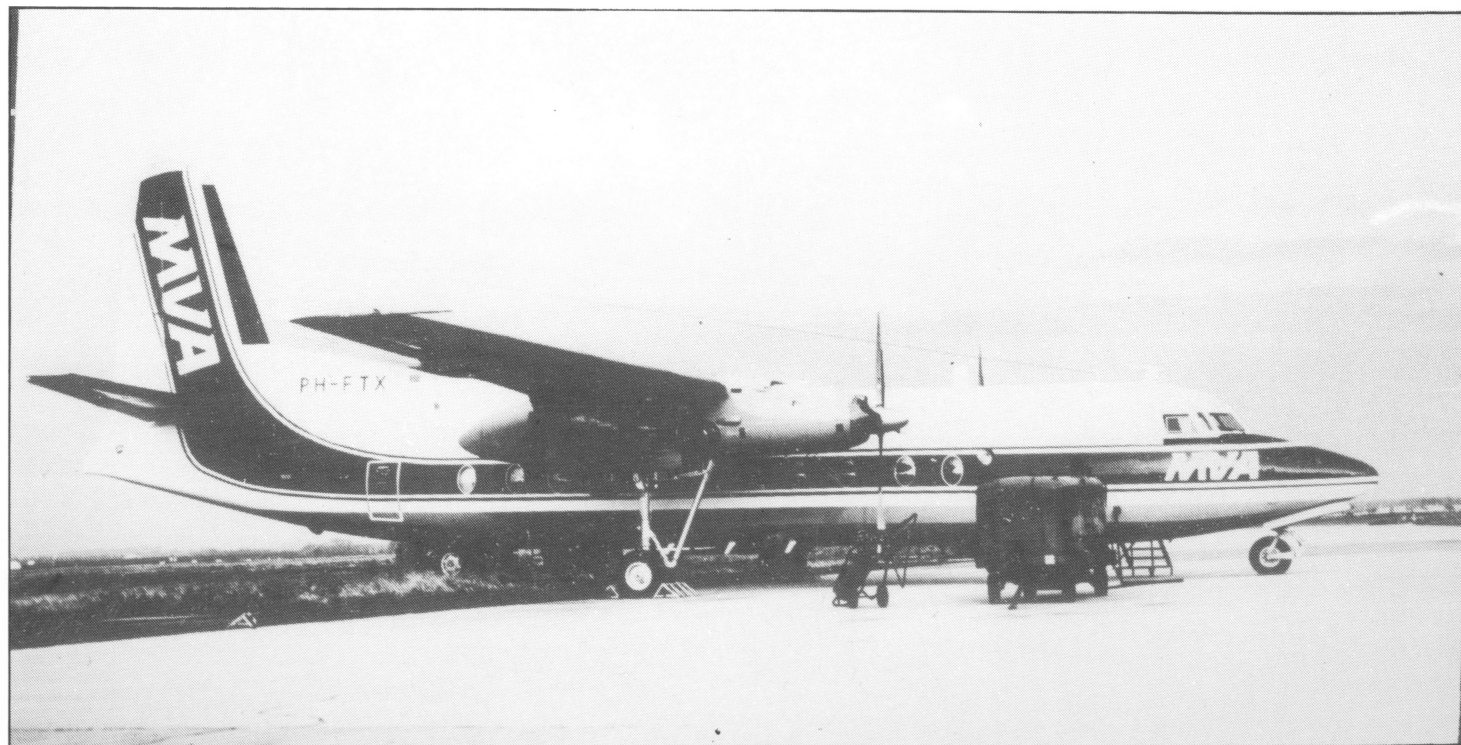
# DUTCH REGISTER NOVEMBER 1980



Piper PA-31 PH-BAB will be followed to the United States by (the late) Business Air Services' PH-NAS soon. PH-KDH, Piper PA-28 Warrior will be rebuilt in the UK.

| Reg         | Type                    | C/n        | Remarks                           |
|-------------|-------------------------|------------|-----------------------------------|
| PH-AFH 2910 | Ralley 150ST            | 3175       | BV de Binderijgroep Vianen        |
| PH-BAB 2307 | Piper PA-31-350         | 31-7552084 | B.A.S. Business Air Service BV    |
| PH-BOS 2452 | Piper PA-28-181         | 28-7615375 | Unify BV                          |
| PH-EAS 3074 | Piper PA-28-181         | 28-8090214 | Netherlands European Air Services |
| PH-FKW 3085 | Fokker F.27-200         | 10326      | Fokker BV                         |
| PH-FTX 3087 | Fokker F.27-500         | 10596      | Fokker BV                         |
| PH-FTR 3076 | Fokker F.27-400         | 10450      | Fokker BV                         |
| PH-GRE 2147 | Reims Cessna F.172M     | 1110       | Air Service Holland BV            |
| PH-HLA 2494 | Beech C.24R             | MC-491     | Technische Handelsmij Hollinda    |
| PH-HLF 2359 | Cessna 182P             | 18264085   | Vliegdiens Holland Noord          |
| PH-IVP 2404 | Piper PA-34-200T        | 34-7670281 | P.M.C.de Wit                      |
| PH-JSA 1641 | Cessna 182N             | 182-60367  | J. Schoenmakers Beheer BV         |
| PH-KAE 1605 | Bolkow Bo.208C          | 636        | G.Ende                            |
| PH-KDH 2565 | Piper PA-28-151         | 28-7715213 | Vliegdiens Holland Noord BV       |
| PH-LUE 1868 | Reims Cessna FA.150L    | 0120       | B.J. Rottink                      |
| PH-LUI 1931 | Reims Cessna F.172L     | 0849       | H.C.W. Verhaaren                  |
| PH-MOT 1202 | Scintex CP.1315C3       | 915        | G.J. Veen                         |
| PH-NKN 3063 | Cameron V-77            | 672        | Holland Balloon Service           |
| PH-RVS 2521 | Partenavia P.68B Victor | 98         | Aircraft Maintenance Amsterdam    |
| PH-SDB 3069 | Piper PA-28-161         | 28-8016322 | Netherlands European Air Serv.    |
| PH-SRN 2385 | Piper PA-28-151         | 28-7615053 | Sticht.Vliegmaterieel Rotterdam   |
| PH-TBT 3000 | Socata TB.9             | 56         | Aviation Francaise BV             |
| PH-TVH 2245 | Boeing 737-222          | 19955      | Luchtvaartmij Transavia Holland   |
| PH-UEG 1818 | Saab S.91A              | 91143      | R.J. Buskop                       |
| PH-WVG 2986 | Piper PA-28-161         | 28-8016235 | Netherlands European Air Serv.    |
| PH-ZBX 3088 | Fokker F.28-4000        | 11159      | Fokker B.V.                       |
| PH-ZBX 3088 | Fokker F.28-4000        | 11159      | Fokker B.V.                       |
| PH-315 977  | KA 7                    | 7095       | Gelderse Zweefvliegclub           |
| PH-543 2411 | Glaser Dirks DG-100     | 63         | T. de Bruine                      |
| PH-591 2658 | Twin Astir              | 3070       | J.G. Kerstens                     |
|             |                         |            | to Aviation Francaise             |
|             |                         |            | to M805PC 24-11-80 (out)          |
|             |                         |            | to Rotterdamse Aeroclub           |
|             |                         |            | (out)                             |
|             |                         |            | ex PH-FKW, CR-LIJ, D2 -           |
|             |                         |            | LIJ, D2-TIJ (new)                 |
|             |                         |            | ex PH-EXM (new)                   |
|             |                         |            | (out)                             |
|             |                         |            | to G-BIIB 27-11-80 (out)          |
|             |                         |            | to BV de Swaan/Bonnist.           |
|             |                         |            | to Air Service Holland            |
|             |                         |            | to H.A. Kapteijns BV              |
|             |                         |            | to Schoenmakers Import            |
|             |                         |            | to W.M. van Doorn                 |
|             |                         |            | ditched 29-5-80 (out)             |
|             |                         |            | to J.A.M. Hofste                  |
|             |                         |            | remains to Germany (out)          |
|             |                         |            | W.J. Muilwijk/v.d. Plas           |
|             |                         |            | to Nikon Europe BV                |
|             |                         |            | to J.Poelstra                     |
|             |                         |            | Ex N82000, OO-HLX (new)           |
|             |                         |            | to H.A. de Gouw                   |
|             |                         |            | to Nordex BV                      |
|             |                         |            | to N841L 31-10-80 (out)           |
|             |                         |            | cr 20-08-78 Bex (out)             |
|             |                         |            | to Rotterdamse Aeroclub           |
|             |                         |            | ex PH-EXT (new)                   |
|             |                         |            | to N107UR Empire (out)            |
|             |                         |            | to Groninger Studenten            |
|             |                         |            | to P.C. Dalm                      |
|             |                         |            | to P.A.A. van Gelder              |

The first Friendship for Mississippi Valley Airlines is PH-FTX which is already delivered. (Ton Jochems).







## SQUADRON SIGNAL PUBLICATIONS

A series on various fighter and bomber aircraft serving during WWII, Korean conflict, Vietnam conflict but also on aircraft serving today. In combination with cutaways & line drawings, profiles and a brief history (especially on operational and/or combat service), these series are illustrated with many and the finest photographs. Titles obtainable are:

F-106 Delta Dart  
F-105 Thunderchief  
A-6 Intruder  
Curtiss P-40  
B-47 Stratofortress  
GD F-111

All DFL 10.85

F-4 Phantom  
F-8 Crusader  
F-100 Super Sabre  
A-4 Skyhawk  
B-17 Flying Fortress  
AH-1 'Gunslingers'  
P-47 Thunderbolt  
Focke Wulf FW.190  
B-24 Liberator  
A-7 Corsair II  
B-52 Stratofortress  
F-15 Eagle  
P-38 Lightning  
Curtiss P-40  
F-104 Starfighter  
F-4U Corsair I  
BF.110 Zerstörer  
F-14 Tomcat  
B-25 Mitchell  
F-6F Hellcat  
A-26 Invader  
P-80 Shooting Star  
C.202

B-36  
F-5 Freedom Fighter

All DFL 13.40

From the same publisher are also a series of book on specific subjects concerning military aviation. The same style as the 'IN ACTION'-series has been used, using many drawings and photos, in combination with much background information.

**TAC** DFL 17.95

A pictorial history of the USAF's Tactical Air Command from 1970 till 1979.

**PHANTOM II** DFL 17.95

A pictorial history of McDonnell-Douglas' Phantom. Well illustrated with photographs, detail & line drawings, profiles.

**REGIA AERONAUTICA** DFL 13.40

A pictorial history of the Italian air force from 1940 till 1943.

**ARMEE DE L'AIR** DFL 13.40

... AND KILL MIGS DFL 17.95

A pictorial history of shooting down MIGs during the Vietnam conflict.

**SOVIET AIRCRAFT TODAY** DFL 20.10

Discussed over 80 pages are all aircraft principally used by the Soviet forces. Unique detailed information, rare photographs, cutaway drawings and profiles.

**AIR FORCE COLORS 1926-1942** DFL 20.10

Discussing the organisation of the USAF with details on unit insignia, colorschemes and unique photographs.

**ACES OF THE SOUTHWEST PACIFIC** DFL 17.95

Descriptions of battle situations during WWII involving USAF pilots based in the southwest Pacific. Illustrated with drawings of individual markings of aircraft involved in these battles.

**ITALIAN AIRCRAFT OF WWI** DFL 20.10

Description of aircraft principally used by Italian forces during WWI.

**ACES OF THE EIGHT** DFL 15.35

Descriptions of air battles during WWII involving USAF pilots based in the U.K.. Illustrated with drawings of individual markings of aircraft involved in these battles.

**U.S. FIGHTERS OF THE FIFTIES** DFL 20.10

The 50s were revolutionary for jet fighters. One prototype after another was produced. Only a few really went into production, but the experiences gained from the test flights by these aircraft were immense and are still used today.

**GERMAN FIGHTERS OF WWII** DFL 17.95

In the years prior WWII, the German aircraft industry developed a series of revolutionary fighter aircraft. Fortunately for the Luftwaffe these new designs were so advanced, they remained fundamentally to the last battles in 1945. Ten of these designs have been described in this book.

**SUPERFORTRESS** DFL 20.10

Rolling of the production-lines in 1944 and 1945, the B-29 Superfortresses were mainly delivered to the 20th Air Force to enter the war in the Far East and Japan. Many bomber missions were carried out by these huge bombers until the last and well-known atomic bomb droppings on Hiroshima and Nagasaki. Well-illustrated is the nose art painting on the B-29 which ranged from patriotic to blatantly sexual.



# FLASH BOOK SERVICE

## HOW TO ORDER BOOKS

All bookorders should be sent to:  
**FLASH AVIATION BOOK SERVICE**  
P.O. BOX 855  
5600 AW EINDHOVEN  
HOLLAND

Payments only in advance to:  
**INTERNATIONAL MONEY ORDER**  
FLASH Aviation (see address above)  
**BANKCHEQUE**

To bank acc.no. 44.46.20.370 Amrobank, Eindhoven, Holland. Bankcheques (excluding Eurocheques) sent to the editorial address will NOT be accepted unless DFL 5.00 is added, to cover costs the bank charges FLASH to cash these cheques.

**POSTGIRO**

To giroacc.no.3126138, P.v.Krommenacker, v.O stadepad 9, Best, Holland.

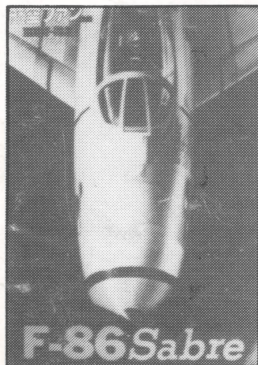
Add DFL.2,- postage & package costs for all orders up to DFL.25,-. All orders over DFL.25,- are post free.

## NEW BOOKS



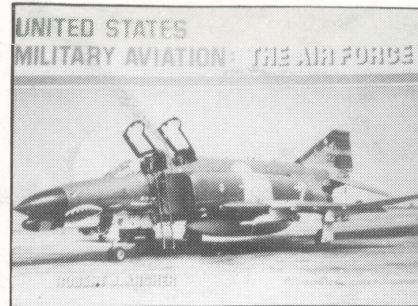
**P-80 Shooting Star** DFL 13.40

This is one of the three books newly introduced by Squadron/Signal Publications. P-80 Shooting Star, written by Larry Davis describes the development of the P-80 on to the T-33 and F-94 Starfire derivatives in American service. The illustrations by Don Greer clearly show details and colour schemes of the different versions, as do the many black and white pictures. This book maintains the high standard of information and illustrations on well known aircraft types in the 'In Action' series of books.



**F-86 Sabre** DFL 29.75

The new Koku-Fan Illustrated books, deal with aircraft even more thorough than the 'Famous Aircraft Of the World' series of books, published by Burin-do as well. Obviously you have to pay more, but this is what you get in return; The F-86 Sabre book contains 224 pages of information including 94 colour photos of Sabre of the rarest Air Forces, and uncountable black and white pictures of the Sabre in action in the numerous Air Forces it flew with, all accompanied by English captions. A listing of the production of the Sabre, and drawings of close-ups and badges are included. Although the text is mainly Japanese, the book is made well worth the price by the 180 pages with photos and illustrations.



## COUNTIES PUBLICATIONS

Conscientious research made aviation enthusiasts to acknowledge the 'MILITARY AVIATION'-series as an excellent reference on listed air arms. Organisation structures of the air arms, history of units, unit badges, registration lists and many illustrations. Complete post-war history of the air arms of the following countries:

|                                                   |           |
|---------------------------------------------------|-----------|
| <b>DUTCH MILITARY AVIATION</b>                    | DFL 18.95 |
| <b>GERMAN MILITARY AVIATION</b>                   | DFL 18.95 |
| <b>BELGIAN MILITARY AVIATION</b>                  | DFL 18.95 |
| <b>SPANISH &amp; PORTUGUESE MILITARY AVIATION</b> | DFL 18.95 |
| <b>FRENCH MILITARY AVIATION</b>                   | DFL 26.95 |
| <b>U.S. MILITARY AVIATION: THE AIR FORCE</b>      | DFL 37.95 |

Other titles obtainable:

**BRITISH CIVIL AIRCRAFT REGISTER** DFL 15.95

Gipsy Moth G-AAAA was the first British civil aircraft to enter the second permanent register in July 1928. Some 150 pages further on Piper Chieftain 350 G-BXFP is the last aircraft to have been included in this reference, containing 22,000 entries.

**U.S. MILITARY AIRCRAFT DESIGNATIONS & SERIALS** DFL 22.50

All serial-numbers of aircraft serving with the U.S. Army, Air Force, Navy, Marine Corps and Coast Guard since 1909, have been indexed according to type designation.

## FAMOUS AIRCRAFT OF THE WORLD

Regularly Burin-do (publisher of Koku-Fan magazine) publishes a special on a military aircraft type. These special issues are extremely well illustrated with many colour photographs. Disadvantage is the text, which is printed in the Japanese language. However, considering the price of these 'Famous Aircraft Of the World' books, this is well compensated by the illustrations which fill most of, on average 70 pages.

New titles available are:

**NR.103 B-52 Stratofortress**

**NR.116 F-5E Tiger**

The previous batch is unfortunately out of stock, but will soon be available again.

Price per issue DFL 8.25

## DUTCH PUBLICATIONS



**NED. KONINKLIJKE LUCHTMACHT** DFL 69.50

A survey of all aircraft types presently serving with the Dutch Air Force, counting 160 pages and illustrated with 130 photos (incl. 10 colour). Additionally the author adds a brief history on the Klu, and pilots' reports on a Dissimilar Air Combat Manoeuvring Training and a trip to a Dutch gunnery range.

**VLIEND VOOR DE VREDE** DFL 32.50

A Dutch publication containing over 400 photographs of aircraft of the United States Air Force in Europe. Additionally explained (in Dutch) are the organisation of the USAF today, as well as the phenomena 'aggressors' and 'deployments'.

This advertisement supercedes all previous adverts.

This stocklist is subject to availability.

**Prices are based on Dutch regulations which govern the prices of all books sold in and from this country.**